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PRACTICAL MANUAL

OF THE

CULTURE OF THE VINE IN THE GIRONDE.

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PART II—THE MANAGEMENT OF A VINEYARD.

CHAPTER I.

GENERAL PRINCIPLES OF PRUNING.

The aim of pruning vines is to promote their fructification, and, at the same time, to keep their vegetation within bounds. It varies according to the locality. The perfection of each method depends upon three fundamental things which the viticulturist must take into account; by these I mean: The form of the vine, the buds reserved for wood for future pruning, and the quantity of fruit the vine is to produce annually.

The *form of the vine* depends upon the method of pruning adopted. That the vine may have the desired shape, when pruning it, we must look ahead and reserve those eyes that, on developing, will furnish the canes necessary for the maintenance of this form.

The *reserve buds*, which are to furnish wood for future pruning, comprise the eyes, the *côts de retour*, which must be left in pruning, and the shoots that are well situated, and which must be spared when the vines are suckered.

The *quantity of fruit* the vine is to be allowed to bear depends upon the vigor and fertility of the vine. To determine it, the vine-grower must consider the pruning of the preceding year and the result obtained. He will see, from the number and size of the canes, whether the vine has increased or diminished in vigor; the fruit stems hanging on the canes will bear witness of its fertility. The amount will be augmented if the vine has acquired vigor, without yielding sufficient fruit. It will be diminished if, the production having been abundant, the vegetation is poor.

Whether the vines are old or young there need be no fear of allowing them to bear too much as long as they are vigorous, but they must be spared when the vegetation is poor or ordinary, which may be due to the quality of the soil, or the natural fertility of the variety.

Intelligently pruned, the vine, provided no accidents befall it, always maintains a regular form, whereas, if pruned regardless of rules, the vines do not preserve their uniformity for any length of time. It is therefore easy, in going through the different vineyards, to see where this operation is performed systematically.

The method of pruning varies in different circumstances. Each method has its own place where it is best executed; it loses its regularity the farther one goes from that particular locality.

In the Gironde there are four principal methods, namely:

First—Short pruning in goblet shape.

Second—The Saint Macaire method.

Third—Pruning to three *astes*.

Fourth—Low pruning.

The first of these methods should be used in the case of extremely fertile varieties, such as the *chasselas, enrageat, or folle blanche,* and the *jurançon blanc,* as well as some very productive red varieties.

The second and third, which favor fructification, must be used only in very fertile soils; bottom lands, good hillsides, or plains.

The fourth is used only in the Médoc.

I will describe these four methods as they are practiced in the localities where they are most systematically executed, and will state the means of perfecting them by remedying certain faults which I have noticed in them.

After having reviewed the diverse methods aforementioned, I will describe the method of pruning *à cordons,* which I have used in my vineyard of La Réole for the last twenty years. I invented this method myself, borrowing from the others that which appeared to me to be advantageous, with reference to culture as well as fructification.

I will also give Doctor Jules Guyot's method of pruning, a very simple method and easy of application, which would be advantageous in our department in soil of average fertility.

I will also say a few words on the culture of the vine *en chaintres,* which was invented about thirty-five years ago by a simple working man, Denis Lusseaudeau, of the Commune of Chissay, near Montrichard (Loir-et-Cher). This method of culture, which would seem strange, not to say extravagant, to many vine-growers of our country, is however very rational. Intelligently applied, it would give splendid results in certain soils in the Gironde.

Those who would like to become thoroughly acquainted with this method, have only to address M. A. Vias, *instituteur à Chissay, par Montrichard (Loir-et-Cher),* and ask for the pamphlet published by him describing this method. This pamphlet, with explanatory illustrations, costs 2 fr. 50 c. (about fifty cents).

It is not my intention to extol one method more than another. I shall endeavor to set forth the principles of each as clearly as possible, leaving to viticulturists to choose that which is best suited for them, with reference to the soil they have to deal with, as well as the aptitudes of the workmen employed.

One thing must not be lost sight of: as soon as the vine, recently planted, puts forth sufficient wood, the method of pruning to be adopted must be decided upon. Every delay in the normal constitution of the stock is a degradation of the vine and a postponement of remunerative production.

Not only is it necessary to train the vine in the first place in the shape it is to assume, but its frame must be complete without delay, in order to have well established vines, without deformity, and in which the sap circulates freely, and properly nourishes each short spur or each fruit branch.

Pruning may be done during repose of the vegetation, that is to say from the time all the leaves have fallen off until the sap begins to circulate, which is about the end of February. The vines must not be pruned, however, when the weather is too cold.

Whatever method of pruning is to be adopted, the treatment of the vine for the first two years is the same.

The vines being planted and earthed up, each plant must be cut down so as to leave only two eyes above ground.

These young vines, sometimes, put forth wood with vigor; very often, on the contrary, but very feeble shoots are developed the first year. Figures 1, 2, 3, and 4 show how the vines look the first year just before pruning; Figure 1, rooted plant or cutting of exceptional prosperity; Figure 2, good result; Figure 3, very ordinary success; Figure 4, very feeble plant.

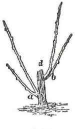

FIG. 1.

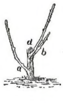

FIG. 2.

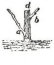

FIG. 3.

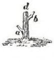

FIG. 4.

This first year, the lowest shoots, *a, a, a,* Figures 1, 2, and 3, must be pruned, leaving one or two eyes, and the others radically suppressed, while keeping the old wood. In the case of feeble vines, such as Figure 4, it suffices to cut off the upper shoots close to the old wood, without pruning the lowest one at all. The old wood, without being injurious, is useful to fasten the young shoots to, and prevents the vine from being covered up with the earth during plowing; it should not be cut off until the second pruning.

It would be well for all young vines, without excepting even the *enrageat,* to be provided with little stakes to keep them straight and well in line, until they are strong enough to dispense with a support. We are speaking here only of vines cultivated without high stakes, the others being obliged to have them at least after the second year.

The second pruning, being usually done with a view to preparing the vine for *anquage* the following year, will be described in speaking of the several methods. The word *anquage* is the term used in nearly all localities of the Gironde to designate the establishment of the forking point, or the beginning of the form of each method of pruning.

Many vine-growers have this forking point close to the ground, and then raise it, little by little, as the vine grows older, by suppressing the lower arms. A vine is like a fruit tree; it must, in its infancy, be trained in the shape it is to have thereafter. It is evident that if the forking point is close to the ground at first, to be raised later on, the wood that has to be pruned will be hard to cut, which is always injurious to the vine. This explains, too, the little uniformity there is in the shape of the vines in some vineyards.

All vines, pruned alike, necessarily have the same aspect, if they are of the same age and if the vineyard has been properly cared for. It is no more difficult to shape a vine on a given plan, than a tree; consequently all vines pruned according to the rules of a certain method, must resemble each other; if there are exceptions they are rare and nearly always due to accident.

In describing each method of pruning, I will mention the localities or vineyards that may be visited as types of each method.

CHAPTER II.

SHORT PRUNING IN GOBLET SHAPE.

Vineyards planted with *enrageat*, or *folle blanche*, or *jurançon blanc*, and in general any very productive red or white variety, should be pruned with short spurs of three eyes at the most. Nearly all the vineyards of white varieties in Fronsadais, Entre-deux-Mers, and Bénauge, are pruned thus. In the communes of Saint Ciers d' Abzac and Maransin, Canton of Guitres, irreproachable types of this method may be seen; thousands of very old vines, pruned as regularly as in Figures 10 and 11, are to be found there.

As soon as the vines are vigorous enough to put forth shoots about three feet long, which is usually the second year, they must be pruned with an eye to the fact that, at the next pruning they will be made to assume their regular fork. In view of this, only the most suitable cane will be left on each vine, and this will be fastened vertically to a stake. (*a*, Fig. 5.)

This cane must be pruned so that the next to the top bud will be at the height at which the forking point is to be established; this must be about one foot above the average level of the ground.

Only the three upper eyes will be left on this cane; all the others are suppressed in pruning; when suckering those that may have been left are taken off. Figure 6 represents a vine of this age pruned and staked.

Every vine thus pruned will put forth two, three, and sometimes four shoots, which must be carefully fastened up. (See Fig. 7.) It is not rare to see fine grapes on vines of this age.

At the third pruning the young vines are made to assume their regular form; to do this, the two canes best situated to form an open V are cut back to two or three eyes, according to the vigor of the subject, and all the other canes are cut off. (See Fig. 8.)

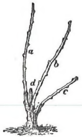

FIG. 5.

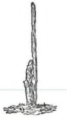

FIG. 6.

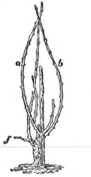

FIG. 7.

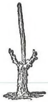

FIG. 8.

In this method of pruning all the suckers on the old wood must be carefully removed—that is to say, all those below the wood pruned that year; this rids the vines of shoots, which being neither fruitful nor useful for future pruning, would occasion confusion in the vegetation of the current year. This operation is effected about the month of May, when all the shoots are well started; it is repeated in June in young vineyards more subject than old ones to superabundant vegetation.

The fourth year, the vines generally put forth from five to eight shoots and should begin to bear well.

At the fourth pruning, if the vines are vigorous, each of the two spurs of the preceding year may be branched; there will then be four spurs of two or three eyes on each vine, as in Figure 9. Vines of ordinary or poor vegetation should be limited to two spurs pruned short, to reduce their production of fruit and augment their vigor. As the vine grows stronger and older, the number of spurs is increased by branching them.

It is hardly before twenty-five or thirty years that a vineyard, properly cared for, attains its perfect development. At this age, each vine should have, according to its vegetative vigor, six, eight, and sometimes ten well established branches, each surmounted by a spur of two eyes. (See Figs. 10 and 11.)

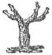

FIG. 9.

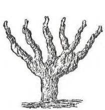

FIG. 10.

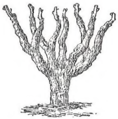

FIG. 11.

To facilitate cultivation, the vine should be kept in goblet shape broadened in the direction of the row. The arms of each vine should be at a good distance from each other in the circumference of the goblet and kept at the same height. Care must be taken to keep the equilibrium as perfect as possible in all the arms of a vine; for this it is simply necessary in pruning to leave less buds on the canes of the vigorous arms, and to pinch the shoots of these arms about the end of June, if necessary.

With this method, a careful vine-grower can prune his vineyard for thirty years without the aid of the saw. This instrument is useful only in exceptional cases; if a main branch is accidentally broken; after a frost or disastrous hail-storm; or when the vineyard, owing to its age, begins to decline, and it is best to moderate its vegetation.

Any viticulturist of experience must understand that by pruning the vines according to the rules we have just given, we can arrive at uniformity in shape throughout the vineyard, as well as perfect equilibrium in the arms of each vine. The sap being equally distributed, the production will be more abundant and of better quality.

I am convinced that the vineyards of Sauternes could be brought to perfection by similar pruning. The soil there is good, and the varieties quite fertile; the vines are all pruned with short wood, but unhappily without method and in a barbarous manner.

It is very much to be regretted that vineyards producing a wine so highly estimated are abandoned to the regular routine. In the large estates, in general, the vine is to the vigneron only a shrub, which he trains in such manner as to make it produce as much wood as possible for fuel. One half of the profit of the wood belongs to him; all the arms which he cuts off, as well as the stumps which he grubs out, are his property; for every thousand cuttings he gets five francs if they are for the owner of the vineyard, and eight and even ten francs if sold to a stranger; his sole advantage depends upon the vigor of the vine. Little does he care whether the vine is fruitful, the vegetation uniform, or the stock high or low; if he can suppress an arm, replacing it by a branch or cane, it is seldom he does not do it to keep up his stock of wood.

I should add that the vine-grower has no intention or knowledge of doing wrong; he has always done this, and seen others do the same thing; he raises a stock to lower it later on, thinking to render it vigorous by this operation. He completely ignores the first principles of vegetable physiology, never having studied methodical pruning. As he makes the best white wine in the world, he would not easily submit to advice on this subject. The only thing that can be done is for an intelligent vine-grower to reform the pruning of this country by himself adopting a rational method.

CHAPTER III.

SAINT MACAIRE METHOD OF PRUNING.

It was with the Saint Macaire method of pruning that I began my viticultural career. To direct my first steps in its application I had an able vine-grower, who very soon initiated me in all the secrets of this method. It is advantageous, in certain respects, but it has its faults.

With this method the vines bear profusely; but, in an abundant year, the grapes are very much crowded at the extremity of the branch; they ripen badly, are inferior, and hence the quality of the grape suffers.

It is in the environs of Saint Macaire, and particularly in Saint Pierre d'Aurillac, that this method of pruning is practiced with the greatest perfection. Before *oïdium* made its appearance the vineyards there were splendid; it was not rare, in abundant years, to obtain eighteen puncheons from one hectare.

The vines in this locality are cultivated *à joualles*, or else in single rows. By *à joualle* we mean, two rows from about two and two thirds to three and one third feet apart. The distance of one *joualle* from another is considerable when cereals are cultivated; it is about six and one half feet in vineyards where there is no intercalary culture. The single rows are far apart when anything is cultivated between them; they are generally about six and a half feet apart in vineyards planted solidly. The distance between the vines in the rows, in the case of *joualles*, as well as single rows, is always about three and a third feet.

The vines of Saint Macaire have two arms, which are trained, as far as possible, lengthwise, in the direction of the rows. The point where the two arms branch off is about one foot from the average level of the ground.

Before going further in the details of this method, I think it would be well, in order that the reader may better comprehend them, to designate the different woods left in pruning, which are: the *tirette*, the *flage*, the *côt*, and the *retour* or *côt de retour*.

The *tirette c*, Figures 16, 18, and 20, is the fruit branch *par excellence*; it is allowed to grow to a length of from two and one third to four feet; the extremity is bent under, forming the curve *g*, Figures 16 and 20; or the twist *h*, Figure 18; upon it depends almost the entire production of the year.

The *flage b*, Figures 14 and 20, is a cane pruned from fourteen to twenty inches long, which, like the *tirette*, is bent over the stock near its base but whose extremity is not curved.

The *côt*, *e*, Figures 14, 16, 18, and 20, is a spur pruned short, so as to leave only two or three eyes at the most; the vine-grower depends upon this *côt* for the next year's *flage* or *tirette*.

The *retour* or *côt de retour*, *f*, Figures 18 and 20, is a small *côt* of one or two eyes at the most, pruned on a spur left on the old wood, either to be used in forming a new arm, or forming a new arm to take the place of one that has grown too long.

Vines of average vegetation usually bear a *côt* on one of the arms and a *tirette* of greater or less length on the other; those that are very vigorous at the adult age, that is to say at twelve or fifteen years, sometimes have a *tirette*, a *flage*, and a *côt*, as is represented in Figure 20.

Each vine is usually supported by two stakes, one placed at the foot to support it and form the curve of the *flage* or of the *tirette;* the other, a smaller one, is placed at a proper distance from the first to support the extremity of the *flage* or *tirette;* sometimes the vines have three props, as represented in Figure 20.

At the second or third pruning, if the vines have acquired sufficient vigor, they must be prepared for the form which they are to be made assume at the next pruning. For this purpose each vine will be pruned so as to leave but one cane, the one best suited to be attached vertically to a stake; it will be topped so that the second bud from the top, *b*, Figure 12, will be about one foot above the average level of the ground. Only the three upper buds, *a*, *b*, *c*, Figure 12, need be left on this cane.

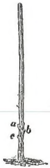

FIG. 12.

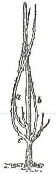

FIG. 13.

Each of these young vines will put forth, according to its vigor, two, three, or four shoots, which must be carefully fastened to the stake as they develop. The result of the vegetation, by the end of Autumn, will be very nearly as represented in Figure 13.

At the next pruning we give the vine its regular form, leaving it after pruning a *côt* and a *flage*. The *côt* should always be left above the *flage;* hence, it is only after careful examination of the stock that the *côt* and *flage* should be chosen, taking care that the forking point will be at the desired height. If the *flage* (Fig. 13) was formed from the cane *b*, the *côt* would be made of the cane *a;* if, on the contrary, the cane *c* was better for the *flage*, the *côt* would then be formed of *b*, that is, just above the *flage*.

The length of the *flage* should be in proportion to the vigor of the subject; it must be bent over on the stake at the foot of the vine, forming at *d* a very regular curve, as is seen by Figure 14.

Figure 15 shows the vegetation of a vine after the fall of the leaves at the end of Autumn, the year it was first formed.

In poor soil, or that of ordinary fertility, the first years the vines are formed, only two *côts* are left on the young stocks. The intelligent vine-grower must never lose sight of the fact, that it is as important to be sparing with the poor vines as it is necessary to be generous with the vigorous ones.

We have already said that the *côt* should have only two eyes at the most. In the case of young vines of great vigor, sometimes three eyes are left. It is on the *côt* that the *flage* or *tirette* is to be found the following year; for this reason it is important that it should not be too long, in order that the shoots may be well nourished, and as near as possible to the crown of the old wood, so that the arms of the vine will not lengthen too quickly.

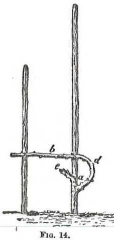

FIG. 14.

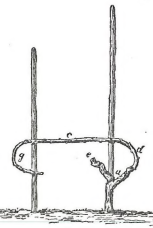

FIG. 16.

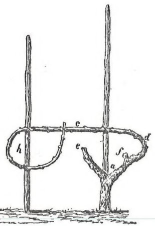

FIG. 18.

The *tirette* being the fruit branch, the production of the vine is regulated thereby. Its length must vary according to the vigor and fertility of the vine. Certain varieties cultivated in Saint Macaire do not bear without a very long *tirette;* others, on the contrary, such as the *grapput* or *bouchalès* would soon be weakened, and produce only inferior grapes with such pruning. It is especially in presence of such facts, that we comprehend the necessity of uniformity in the varieties that I recommended in the first part of this book.

The *flage* or *tirette* must be bent firmly, being brought over the stock and fastened to the stake (see *d*, Figs. 14, 16, and 18). This curve is for the purpose of hindering too great a circulation of the sap towards the extremity, and to induce the development of several rather vigorous shoots at the base of the *tirette* for establishing the *côt* at the next pruning. Without this precaution, if the curve was not drawn sharply enough, the sap would be carried in abundance towards the extremity of the fruit branch, the eyes at the base would prove abortive, or would be developed far from the old wood, and the arms would lengthen too rapidly, which would be very unfortunate.

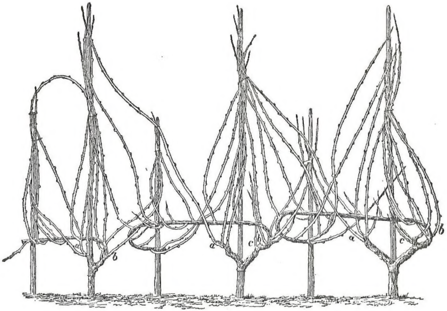

FIG. 15. FIG. 17. FIG. 19.

To assure the equilibrium of the vines, the *tirette* must every year be changed to the opposite arm. If always on the same side, this arm would become very strong, to the detriment of the other; the vegetation finally would be all on that side; the *côt*, being pruned short, does not lengthen the arm as does the *tirette*, so that if the latter was on the same arm for several years, there would be no uniformity in the height, a fault that must be avoided.

The *tirettes* of the same row should, as far as possible, be trained in the same direction, one year to the right, and the next to the left; thus the confusion arising from two fruit branches crossing each other on the same small stake is avoided.

These explanations given, we now come to the time of the fifth pruning; that is to say, that pruning following that whereby we gave the vine its regular shape.

To prune the vine (Fig. 15), as we have it, with its vegetation developed after the fourth pruning, we will choose on the *côt* the shoot most suitable for forming the *tirette*, say the shoot *a*, and at the base of the *flage* of the preceding years a cane suitable for the *côt*, say the cane *b*.

From this time on, the pruning by this method will be the same; a *côt* and a *tirette* to each vine, situated alternately one year on one arm, and the next on the other; such is the rule to be observed. It is also necessary to guard against lengthening the arms too rapidly, which is injurious to them. This will not happen, provided the shoots are not too numerous and the binding of the canes to the stakes is well executed, and the *flages* or *tirettes* curved as has been described.

At the age of eight years the well trained vine will appear as represented in Figures 16 and 17. One represents the vine after pruning and staking, the other shows it as it looks at the end of the next Autumn, before pruning. At the age of twelve years the vine will be at its prime. It will appear as shown in Figures 18 and 19.

About the age of twelve years, when the vines are in very fertile soil, it is well to add an extra arm so as to have two fruit branches on the same vine, a *flage* and a *tirette*, as is seen in Figure 20, always leaving a *côt* to assure the next year's pruning.

When the time for forming this new fork has come, in ridding the vine of shoots, a suitable one is left (*c*, Fig. 17), which is pruned back to one eye of the first year, and the second and third forms a *côt*. This *côt*, well constituted, will be able to support an *aste* or a *tirette*, as seen in Figure 20.

Vines properly cared for, according to this method, have a general uniform aspect. They begin to bear well by the fourth or fifth years. This production increases up to the age of twenty years, and is maintained for a very long time.

If the vines are not mutilated too much by being cut back they will live to be very old. When it is of advantage to shorten an arm it need not be cut nearer than eight or ten inches from the forking point.

In the culture of the vines at Saint Macaire the shoots are neither pinched nor Summer-pruned. They are allowed to grow luxuriously even to the top of the stake, which, I am sure, contributes to the vigor and health of the vineyard.

The removal of the suckers developed on the old wood—that is, from the ground up to the crown of the *côt*, *aste*, or *tirette*—is done very carefully, every one being suppressed. There is no exception to this rule, unless it is desired to form a new fork on one of the arms; then the work is done as has already been described.

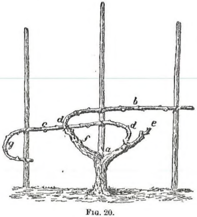

FIG. 20.

This method of pruning has been described as it is executed by the best practitioners; the explanations previously given, as well as the figures from 14 to 20, give an idea of the framework of the vines at different ages. It is important for the vines to form a straight wall along the rows, especially in plowed vineyards.

The vegetation of the vines pruned by this method remains to be considered. The *côts* (*e*, Figures 14, 16, 18, and 20) put forth from two to three vigorous and well constituted shoots. The one best situated must serve as the *aste* or *tirette*. However, it is well to observe that, of two shoots equally well situated, one of which is very vigorous and the other of average size, there should be no hesitation in choosing the latter, as it is more fruitful and easier to train.

If the *flages* (*b*, Figs. 14 and 20) and the *tirettes* (*c*, Figs. 16, 18, and 20) have been properly curved, they will always put forth near their base shoots of average size, but suitable for forming *côts*; on the curved part several vigorous shoots are always put forth; in the center, poor shoots, some of them abortive; finally, at the extremity of the *flages*, or on the twist of the *tirettes*, several shoots, the most vigorous of the vine, are developed.

On an average, on the *tirettes* of an adult vine of ordinary vigor, there are from twenty to twenty-two shoots, which develop more or less vigorously; and two on the *côt*—say about twenty-four to a vine.

One third of these form very vigorous canes; one third canes of average length; and the other third develop with difficulty, some of them after showing signs of development proving abortive. I must add that the most vigorous shoots, near the old wood, do not yield the finest grapes; they are found on those of ordinary vigor or those near the extremity of the *tirette*.

We have already stated that pinching is unknown in Saint Macaire, which is unfortunate, as it would be a very easy means of improving the equilibrium of the vegetation of a *tirette*. The vigorous shoots on this fruit branch are useless for the next pruning. By rigidly pinching those disposed to acquire great development, the force of the sap would be conveyed to the feeble buds as well as those tending to be abortive.

For several years past some vine-growers, to economize in the matter of stakes, have trained the canes on iron wire. The vine receives a little more air, but the *flages* and *tirettes* cannot be curved so well, and the shape of the vine suffers for that reason.

The principal varieties cultivated in Saint Macaire are: the *mancin*, *prueras*, *grapput* or *bouchalès*, *petite parde* or *pardotte*, *grosse parde* or *gros noir*, *panereuil* or *bois droit*, *piquepoul*, *vigney* or *merlot*, and the *queue rouge* or *malbec*. These varieties are for the most part very common and harsh, which, added to the nature of the fruit branch, whose extremity in abundant years is loaded with a crowded mass of grapes, affects the quality of the wines produced in these localities. The wines are known to be of very ordinary quality; they are firm, but when new, are harsh and very often greenish.

During the last twenty years better varieties have been selected: the quality of the wines from certain vineyards already bears evidence of this fact.

Throughout the country, cultivation of the soil is generally well understood and executed intelligently. The great majority of vine-growers, many of whom own their vineyards, understand the importance of the young annual rootlets with reference to good maturity of the fruit. They are careful to induce their growth and development by Summer cultivation, given lightly and to the purpose. The rootlets developed above the collar of the roots are suppressed every year by the first cultivation, which is given in the month of April.

CHAPTER IV.

METHOD OF PRUNING ADOPTED IN BOTTOM LANDS.

This method of pruning, which gives the vine the shape of a cross, is generally adopted in all the bottom lands and islands of the Gironde. The localities where it is best executed are found on the banks of the Dordogne, from Acques to beyond Libourne. Very fine specimens of it are seen in the bottom lands of Campus, Nauzegrand, Arveyres, and Fronsac.

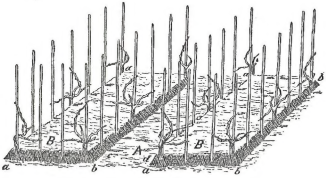

FIG. 21.

Vines in bottom lands are generally planted about six and a half feet apart in every direction. Formerly in such localities they were almost always cultivated with the *marre*, and planted out in checks. Figure 21 is a representation of this sort of culture. The lower part (*A*, Fig. 21), between the checks, is called the *reuille* or *rouille;* in many localities hay is grown there; sometimes wheat is cultivated on the high part (*B*), which is designated by the name *hautain* or *platain;* it is about ten or twelve inches above the level of the *reuille*.

Bottom-land vineyards are generally planted with rooted vines, care being taken that a part of the head of roots, called the *mère*, is inclined horizontally in the direction of the *platain*. (See Fig. 22.)

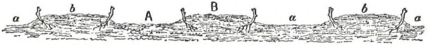

FIG. 22.

Before the use of iron wire each adult vine had three stakes; and, for at least two years, during the time of forming the forks, a small supplementary stake was used that the center *aste* might be well supported. The stakes used in bottom lands are generally of chestnut or gem pine.

The terms used to designate the various parts of the vine in pruning are:

The *aste:* this is the main fruit branch, having on an average from six to eight buds; there are three to a vine; they are trained on stakes.

The *côt cabaley:* each *aste* generally has its *côt cabaley* from six to ten inches below it. It has from three to five buds, and is tied up to the *aste*, which it has to replace when the latter becomes too long.

The *œil* or *œil de retour* or *de rapprochement;* on it is established the *côt cabaley*, when the *aste* is too long and has to be suppressed. It is pruned so that it has but one or two eyes at the most.

An arm is made of the *aste*, with its accompanying *côt cabaley* and *œil de retour*, thus: (Fig. 31); *B*, right arm; *A*, left arm; and *C*, center arm.

There are two methods of forming the vines in bottom land vineyards. The *anquage, sur filleule*, an excellent modern method, and the ancient one, using the lateral shoots developed on a vertical cane prepared for this purpose the preceding year. We will describe the two methods, beginning with the first:

It is generally the second year, if the plantation is successful, that the vines are made ready for the form that will be given them later; only one shoot on each vine is allowed to develop, and this shoot is carefully fastened to a stake to prevent its being injured in any way. (Fig. 23.)

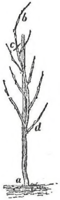

FIG. 23.

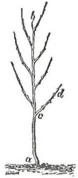

FIG. 24.

In the month of August, this shoot is topped at *c*, at a height of about five and one half feet. This operation causes the lateral eyes of this single stem to develop, as is seen in the young vine freed from its stake, represented by Figure 24; but the chief aim is to induce the development at the point where the fork is to be of a branch cane (*c*, *d*) sufficiently vigorous to constitute, with the main stem (*b*), the two lateral arms of the vine. All the eyes below the shoot must be radically suppressed. This shoot being the lowest, will have to be treated intelligently, in order that it may acquire the vigor necessary for it to form one of the arms.

Topping the main stem deserves some attention; it must be cut more or less short according to the vigor of the subject. In topping a vigorous subject too short, there is danger of inducing the development, not only of the shoots, but of the counter-shoots also; if on the contrary, a subject of ordinary vigor is not cut short enough, only the upper buds of the cane will develop, and the desired result is not obtained.

We recommend especially a method little used, but excellent, simple, and practical, by means of which we are sure of obtaining, with perfect success, a branch cane almost as vigorous as the main cane. It consists of bending the principal cane so that the shoot which is to form the branch cane is situated just at the point where the stem begins to bend; the latter is attached to a little stake placed at one side, and its extremity uplifted, as is seen in Figure 25.

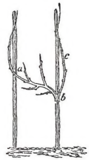

Fig. 25.

This useful shoot, situated as it is on the curve, never fails to develop vigorously, whereas those above remain stationary to some extent. By using this method, the operation of topping the main stem loses its importance, and no longer needs to be calculated with such precision.

In this method of pruning the height of the forking point varies according to localities. It is generally established at about twenty or twenty-four inches above the ground. It would be necessary to raise it a little higher in vineyards subjected to the effects of Spring frosts.

The eye destined to furnish the branch cane necessary to form the fork, and which has just been spoken of, must be chosen by an expert and careful workman, who suppresses all the other buds from this point down to the ground. The bending of the canes which takes place either before or after this disbudding, requires a great deal of precaution. It is necessary to see that the eye in question is well on the curve, in order that the sap will be carried to it with more force.

In the Autumn following this operation the results obtained are those of Figure 24 or 25, according as to whether we have used the ordinary method or have adopted the modified one just explained. In pruning, in either case, the branch cane should be allowed such length as is necessary to enable it to be tied to the stake; leaving it, as is the case of the main cane, only two, three, or four buds at the most; the young vine thus pruned is then trained on three stakes, as shown in Figure 26.

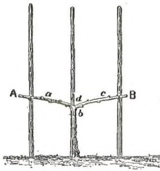

Fig. 26.

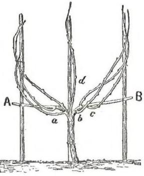

Fig. 27.

With this pruning and training, executed as we have just described, the result obtained should be as is represented in Figure 27, which portrays a vine in the Autumn of the fourth year, having three canes on each of the two parallel arms, and one cane developed from the eye situated at the axle of the two established *astes*. This cane (*d*, Fig. 27) serves to form the third or center arm.

When, in forming the fork of the vine the branch cane is found to be very feeble, it is pruned so as to leave only two or three eyes, as represented in Figure 28, taking care to fasten a little above the *côt* (*c*) a simple ozier or branch.

It is very necessary to separate the shoots of the different arms in fastening them to the stakes; those from each *aste* being attached to the stake on that side of the vine, as is seen in Figure 27. The shoots of the center arm must be tied up to the center stake.

In pruning the vine after the development of the fourth year's vegetation, the two lateral arms must be formed from two canes of the same vigor, and, in preference, situated below the *astes* of the preceding year; say *a* for the *aste* on the left arm, and *b* or *c* for the *aste* on the right arm (see Fig. 27); these two *astes* should be topped at a length of about twenty-eight inches, and fastened to the stakes placed on each side of the vine, with the inclination shown in Figure 29; only four, five, or six buds, according to the vigor of the subject, are left on these *astes*.

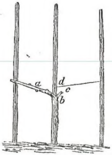

Fig. 28.

One and sometimes two shoots will be developed at each of the eyes that have been left on these *astes*; they must be tied up very carefully.

The cane *d*, Figure 27, destined to form the center arm, must be topped at a height of from fourteen to sixteen inches, bent almost horizontally, and fastened to a small stake that is there in the *platain*, or high part of the ground, for its special support. Only three or four buds need be left on this *aste*. (*C*, Fig. 29.)

The vine, when pruned after the development of its new vegetation the fifth year, has the aspect of Figure 30. The right arm, *B*, bears an *aste* of seven buds with an *œil de retour*, *f*, of two buds. The left arm, *A*, bears an *aste* of seven buds, a *côt cabaley*, *e*, of three buds, and, finally, the *aste* of the center arm, *C*, has four buds. This latter should be attached horizontally to a small stake.

The vine is now well established. It is important to allow it a suitable number of shoots, taking care always to preserve perfect equilibrium in the vegetation of the three arms.

Figure 31 represents a vine seven or eight years old, pruned and trained. The right arm, *B*, consists of an *aste* of seven or eight buds, a *côt cabaley*, *e*, of four or five buds, and an *œil de retour*, *f*, of two eyes, on which the *côt cabaley* will be left the following year if the *aste* is cut back. The left arm, *A*, consists of an *aste* of seven or eight buds and a *côt cabaley*, *e*, of four or five buds. Finally, the center arm, *C*, bears an *aste*, *d*, of seven buds, and a *côt de retour*, *f*, of two eyes, on which, the following year, a *côt cabaley* will be established.

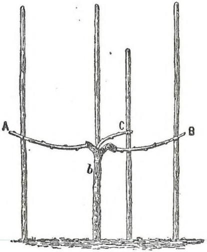

FIG. 29.

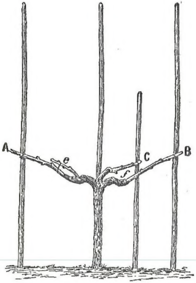

FIG. 30.

We have already stated that on the crotch of the *branch cane* (*b*, *c*, Fig. 25), a bud is developed the third year (*d*, Fig. 27). This shoot is destined to form the third arm of the vine (*C*, Fig. 31).

It is easy to see that if this arm were trained up vertically, as is done in many vineyards pruned by this method, the equilibrium of the vine would be destroyed, the sap being conveyed in greater abundance to it than to the lateral arms trained almost horizontally.

To remedy this inconvenience a very simple method is used in the magnificent vineyards in the bottom lands of Fronsac and Libourne. This method, which is adapted to the particular inclination given to the center arm, is entirely successful in maintaining the three arms of the same vine in perfect equilibrium.

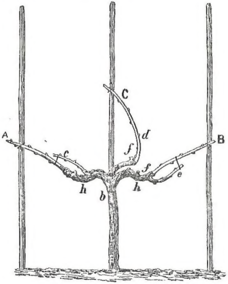

FIG. 31.

We have already seen that the cane *d* (Fig. 27), destined to form the center arm, must be topped at a height of from fourteen to sixteen inches, and fastened horizontally to a small stake placed in the *platain*, only three or four buds being left on it (*C*, Fig. 29). Figure 32 gives a side view of this *aste*, with the shoots developed thereon.

The following year all the wood is cut back to the *aste* *d* (Fig. 32), and only five or six buds left; the *aste* is then trained as shown in Figure 33.

Figures 32, 33, 34, 35, 36, and 37 give a side view of the center arm from the time of its formation up to the adult age. As we see, this arm is always horizontal for a length of from eight to ten inches. At this point the *aste* is bent upwards and fastened at its extremity to the stake placed at the foot of the vine.

The value of this arm is due to the horizontal position of one part of it; it prevents the sap being conveyed to it in greater abundance than to the lateral arms, and consequently perfect equilibrium of the vine is maintained.

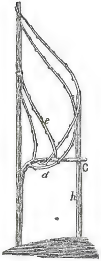

Fig. 32.

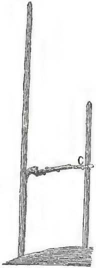

Fig. 33.

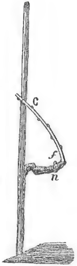

Fig. 34.

The pruning of the vertical arm does not differ from that of the lateral arms; like the latter, it has an *aste* of from five to seven buds, a *côt cabaley* of three or four buds, and a little *côt de retour*. (See Fig. 36.)

On the lateral arms, as well as the center one, the suppressions and renewals should not be made nearer than eight or ten inches to the forking point of the three arms; it is therefore important that the *côt de retour* should not be left nearer than that; say at *h*, *h*, (Fig. 13) for the lateral arms, and at *n*, *n*, (see Figs. 34, 37) for the center arm. It is well known that amputations too near the stock very often destroy the equilibrium of the vine.

It is important, to prevent confusion, that the *aste* and *côt cabaley* should not be too near each other; many vine-growers commit this error, and leave nearly as many buds on the one as the other, which is exceedingly wrong. In well executed pruning the *côt cabaley* should be in good position to preserve regularity in the form of the vine; it should be allowed a moderate number of eyes, in order that all those left on it may develop as though the *aste* had to be established there the following year, which, however, is not absolutely necessary.

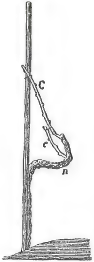

Fig. 35.

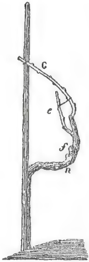

Fig. 36.

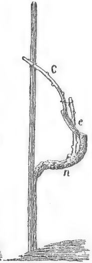

Fig. 37.

The *côt cabaley* being established under good conditions, there should be no fear of looking at some little distance from it to choose a fruitful *aste*, which must be allowed a good many buds if the vine is vigorous. The *aste* regulates its amount of vegetation itself, putting forth only as many shoots as it is able to nourish, and always in preference those at the extremity, which yield the most fruit. This cane having to be cut back and a new one established on the *côt cabaley* the following year, there is no reason why it should not be bare at its base, whereas, on the contrary, it is very important that the *côt cabaley* should not be lengthened.

We are now going to describe the method of forming the fork of the vine that is most generally used in pruning in bottom land vineyards.

The third year, only one shoot is left on the young vine, and this is topped so that the second bud from the top (*b*, Fig. 38) may be at the average height of the fork that is to be established. Only three buds (*a*, *b*, *c*), are left on this cane, which, if the vine is vigorous, develops as illustrated in Figure 39; that is, each bud nearly always produces two shoots.

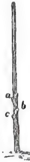

Fig. 38.

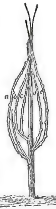

Fig. 39.

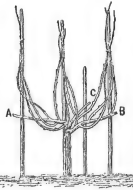

Fig. 40.

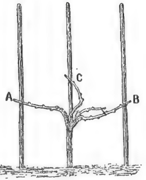

Fig. 41.

The next year the fork of the vine is formed; the cane *b* or *c* (Fig. 39) forms the left *aste;* the cane *e* the right *aste;* and the cane *d*, developed by the counter bud of the cane *e*, serves to form the center *aste*. Figure 40 represents a vine one year after the fork is formed, which is done by the most common method. Figure 41 gives the aspect of a vine two years after the establishment of the fork, and the three arms are pruned according to the principles given previously with regard to vines *sur filleules*.

A vine-grower can always recognize vines forked *sur filleule*, but the ordinary method of forming the fork, if well executed, gives almost as regular shapes.

Towards the end of May all the suckers coming from the old wood are radically removed, taking all those from the ground up to the first shoot of the current year left on each arm for wood for pruning later on, whether it be a *côt de retour*, a *côt cabaley*, or an *aste*. In this operation it is necessary to see whether some new shoots should not be left for establishing *côts de retour*. It must be remembered that only those in good position should be left, if it is desired to maintain the vine in perfect shape.

Pinching, with very rare exceptions, is not practiced in vineyards pruned according to this system; the shoots are simply topped with the pruning knife when the vegetation becomes too weak during the course of the Summer.

Pinching two or three shoots at the extremity of each *aste*, close to the fruit, would produce excellent results. These shoots, generally becoming very vigorous, absorb a great quantity of the sap, while they are of no use for wood for pruning the next year. By pinching them, as we have described, the fruit would not suffer therefrom, and the sap otherwise absorbed by them would benefit the lower shoots, which would nourish their grapes better, and furnish the very finest wood for pruning.

This method of pruning, as well as that of Saint Macaire, described in the preceding chapter, is excellent for rich soil, provided it is well executed; by its means the vineyard will produce all that can be rightly expected of it, considering the fertility of the soil. In identical soils the Saint Macaire method perhaps gives more abundant products; they are surely inferior in quality to those obtained by the method used in bottom lands. It is easy to account for this difference in quality simply from the appearance of the grapes on the canes at the vintage time. They are better distributed and spread out over the vines more in bottom land vineyards; they thus enjoy more light and heat than the fruit of the Saint Macaire vines, which is crowded together at the extremity of the *tirettes*. In abundant years we have very often found cases where the grapes in the middle of this crowded mass of fruit remained almost white and did not ripen perfectly.

CHAPTER V.

PRUNING IN THE DISTRICTS OF THE GRAVES OR CÔTES.

By the name of *graves* or *côtes*, we mean soils that are not very fertile, which sometimes produce excellent wines, but in which the vegetation of the vine is below the ordinary.

Outside of Médoc, which also may be considered as a gravelly country (*graves*) there exists no special method deserving mention or founded upon principles worthy of argument; each locality has its customs, and the result is an irrational mixture of the divers methods. We will not call attention to the localities where we have met with these eccentric methods; our aim is to induce viticulturists to adopt a rational method; we hope our modest manual will furnish them the means of so doing.

To this end we shall recommend for these *graves* or *côtes*, either a simplified form of the Saint Macaire method, represented by Figures 42, 43, 44, and 45, or of the bottom land method, represented by Figures 46 to 50, which is no other than the bottom land method with the center *aste* wanting. The fertility of the *graves* varies indefinitely. There are cases in which the vine vegetates as vigorously in it as in the best bottom lands, and in which the Saint Macaire method, as well as that of the bottom lands, can be applied without any modification. We shall confine ourselves in this chapter, as we said in the beginning, to soils in which the vegetation of the vine is below the ordinary standard.

It must not be forgotten that all cultivated varieties may be divided into two categories: those that are very fertile, and that should be pruned short if we do not wish to see them soon exhausted, and those whose more difficult fructification demands longer pruning. It is acknowledged, without controversy, that the buds at the base of the canes are less fruitful than those farther from the old wood; hence, in dealing with fine varieties, which generally are not fertile, only as many of those at the base should be left as are necessary for assuring fruit branches for future pruning, and the whole force of the sap be concentrated in the development of a large number of shoots for fruit branches of the current year.

We are convinced that in place of having four or five arms to a vine, as is the case in many localities, two are always sufficient, at least in the soil we are now considering, in order that the vineyard may yield the maximum of production that can be rightly expected of it. If the simplified form of the Saint Macaire method is used the *côt* will always furnish a fruit branch for the next year's pruning; all the superfluous sap may be utilized for the *flage*, which is pruned more or less long, according to the vigor of the subject. If the simplified form of the bottom-land method is adopted, the *côts cabaley* or *côts de retour* will assure wood for future pruning, while the *astes* will furnish their contingent of grapes. The equilibrium, too, is easier to maintain in two arms than in a larger number.

If it is desired to adopt the simplified form of the Saint Macaire method, the vines must be planted about three feet apart. The forks of the vines are formed the third or fourth year at a height of about eight or ten inches above the average level of the ground, the same rules being followed as in shaping the vines by the Saint Macaire method. (Page 28.)

The two arms should be pruned as *côts*, each being allowed two eyes until the vine is able to support a *flage;* the latter will be proportionate to the vigor of the subject, and must be bent over and fastened to the stake as shown in Figures 44 and 45.

The *flage* must be bent over so as to hinder the flow of the sap in order to compel the development at its base of shoots on which the *côt* may be established as near as possible to the old wood the following year; if the *flage* were not properly curved, the plant would be developed too rapidly, which would necessitate cutting back the long arms to the detriment of the vine.

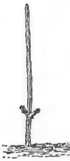
FIG. 42.

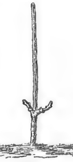
FIG. 43.

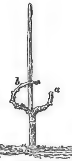
FIG. 44.

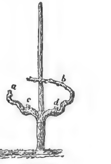
FIG. 45.

In the district of the *côtes*, where the bottom land pruning is in use, it is preferable to adopt the simplified form of this method represented by Figures 46–50.

With this method, the vines have only two arms; they must be planted at a distance of from about four to five feet apart, according to the fertility of the soil. The forking point should be about one foot above the average level of the ground, and is formed either as has been explained to fork *sur filleule*, or by the ordinary method, which gives the result of Figure 46.

This method is admirably adapted to the use of iron wire. The fork being regularly established at the height of ten or twelve inches, as indicated by the horizontal dotted line in Figures 48 and 49, one piece of iron wire should be stretched about fourteen inches above it, and a second piece about sixteen inches above the first. The iron wire is held in place by being fastened to the stakes at the foot of the vine, or, if preferred, to strong stakes placed at every sixteen or twenty feet; all that is needed then for the support of the vines, is a small stake high enough to reach the first iron wire to which each vine is fastened by a bit of willow. The extremities of the *astes* are attached to the first wire, and the shoots are fastened to and supported by the second. Figures 48, 49, and 50, illustrate this better than it can be described in words.

The young vine having been prepared for the establishment of the fork later on, and having the appearance of Figure 46, will be pruned so that it will have two *astes* formed from the canes *a*, *b*, those being best situated for this purpose. These two *astes*, on each of which only three or four buds should be left, must be fastened to the first iron wire; when the new shoots develop the vine should resemble Figure 47, which represents a vine after the development of its new vegetation the fifth year.

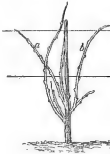
FIG. 46.

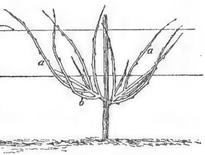
FIG. 47.

Figure 48 shows us this same vine pruned and trained; on each arm there is an *aste* of four or five buds with a little *côt cabaley* of two or three eyes. From this on, the pruning should be executed according to the rules given for bottom land pruning, with this difference: that less buds should be left on the *astes* as well as on the *côts cabaley*, since the vines are less vigorous. Figures 49 and 50 represent adult vines well pruned and trained.

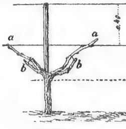
FIG. 48.

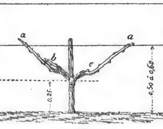
FIG. 49.

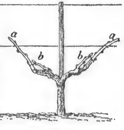
FIG. 50.

Some viticulturists have contracted a habit of leaving a little *côt* instead of the *côt cabaley*, to avoid the trouble of fastening it up. If it is desired to have a regular and well conducted vineyard, it is indispensable to prune the *côts* so that they are long enough to be tied up, the superfluous eyes being suppressed. If, in certain localities the vines are of bad shape, it is due to the poor choice of wood for the next year's pruning, and to the little care bestowed upon training the canes in the proper direction.

Pinching two or three upper shoots of each *aste*, close to the last bunch of the fruit, gives excellent results; hence we can do no less than to recommend it to persons who are anxious to prosper. It should be done about the end of May, or the beginning of June; that is to say, when the fruit is formed and before the shoot acquires much development. Pinching, thus executed, does not hinder the fruit from developing, nor the grapes from becoming as fine as though grown on very vigorous shoots. These shoots, pinched close to the fruit, seldom start out anew, and the sap that would have been really wasted on them, since they are useless as wood for pruning, flows back to the lower shoots or the *côts*, whose canes are more necessary as wood for pruning.

As we have recommended in the other methods of pruning, it is necessary to be sparing of severe amputations, and never to make them too near the fork of the vine. A moderate amount of fruit must be allowed the vines if we do not wish them to wear out too rapidly.

The suckering should be practiced regularly every year about the end of May. In this operation, all the shoots developed on the old wood are taken off, excepting those that are useful to form *côts de retour*, on which the *côts cabaley* are afterwards established.

CHAPTER VI.

METHOD OF PRUNING VINES IN MÉDOC.

Vines in Médoc are generally planted about three feet apart in every direction; they are pruned, trained, and cultivated in a manner peculiar to that locality. The general aspect of the vineyards is somewhat uniform, although the experienced viticulturist is able to notice quite marked differences.

The low pruning of Médoc is not found to be applied exclusively until one has passed beyond the commune of Blanquefort, where in many vineyards high pruning is used; or, in other words, the vines are supported by long stakes. But, beginning with the commune of Pian and going as far as Bas-Médoc, only low vines are to be seen, if we except some small vineyards, relatively unimportant, in the bottom land on the banks of the river.

In the country, lying between Saint-Julien and Saint-Estèphe, vines yield the most abundant vintage of any locality in all Médoc. This may depend in part upon the quality of the soil, but is especially due to the fact that the pruning is better executed there. In this region the shape of the vines is more regular, and they are allowed to produce more fruit, which does not at all injure the quality of the wine, since it is there that there are grouped the greatest number of classed growths (*crûs classés*).

Plowing in Médoc is effected by means of two oxen yoked by the forehead, passing along on each side of the row. This explains the adoption in that country of stakes a little over two feet long, their average height above ground being about fourteen or sixteen inches. They are all connected, from one end of the row to the other, by a lath of pine wood or an iron wire fastened to these stakes at about two inches below their tops.

A peculiar method of pruning is adopted for this sort of training. We shall describe it as practiced in Pauillac and Saint-Estèphe, the localities where it seemed to us to be, in general, most correctly and systematically executed.

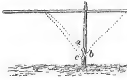

FIG. 51.

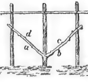

FIG. 53.

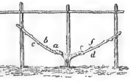

FIG. 55.

About the age of three or four years, according to the vigor and prosperous condition of the plantation, the vines are prepared to be given their regular shape at the next pruning; the vine is pruned so that only one cane is left (Fig. 51); the next to the top bud (*b*) should be at the average height at which the fork is to be established. A third bud (*c*) is left, in case it will be needed, but all the others are suppressed, either during pruning or when removing the shoots. The average height of the fork is on a level with, or a little above, the crest of the furrow; say about four inches above the level of the ground.

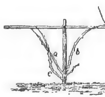

FIG. 52.

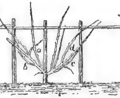

FIG. 54.

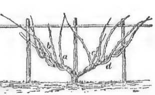

FIG. 56.

During the course of the year in which this preparatory pruning is executed, the shoots, divided into groups, are carefully fastened to the wire, as shown by the dotted line in Figure 51, and by Figure 52. This last illustration shows the vegetation of the current year of the young vine at the time of pruning.

The fork is to be formed either by the canes *a b* or *c b*; that is to say, those that combine the best conditions of vigor, height, or direction. The two canes are pruned rather long, in order that they may be fastened either to the stakes or the lath, as shown in Figure 53. Only three or four buds are left on each arm; all the superfluous ones above are suppressed.

Before proceeding further, it will be well to initiate the reader in the terms employed in Médoc to designate the several members of the vine in pruning according to this method.

The flexible *aste*, *d* (Figs. 60, 61, and 62), is the fruit branch *par excellence* left only on vigorous vines and those only of a certain age. It is most frequently met with in the vineyards of Saint Estèphe; as many as ten buds are left on it.

The ordinary *aste*, *b* (Figs. 57–62), is the fruit branch of all adult vines; five or six buds are left on it. It is pruned rather long that it may reach, and be fastened to, the wire or the stake; the superfluous buds at the extremity are removed in pruning.

The *tiret*, *c*, is a little *aste* on vines that are not vigorous, as illustrated in Figure 58, or in Figures 59–62, and serves to replace the flexible *aste*, or the ordinary *aste* when the latter becomes too long. Only three or four buds at the most are left on the *tiret.*

Finally, the *œil* or *côt de retour*, *a* (Figs. 57–62) is a spur having one or two eyes, generally left on a sucker spared when the others were removed. These *côts* constitute a means of resource, forming the base of every *tiret* or *aste*; it is therefore important that they should be well situated, as the regular shape of the vine depends upon them. They must never be less than four inches from the fork of the vine, in order to avoid pruning too near this point.

The year the fork is established, three or four shoots are developed on each *aste*, as shown in Figure 54. At the next pruning the young vine should be allowed two *astes* chosen from among canes of good direction, and, as far as possible, of equal vigor, in order to equalize the vegetation, which is an important matter during the first years. From four to six buds, according to the vigor of the subject, are left on the *aste*; these *astes* are fastened to the lath or the stake, as shown in Figure 55.

Figure 56 gives us an idea of the vegetation of a vine pruned as we have just described. We should remark, in passing, that up to this the figures in this chapter have represented vines of very ordinary vegetation, and that is the reason that but a moderate number of shoots is allowed them. In Médoc, as elsewhere, we shall recommend shaping the vines when young, and allowing them to develop a good many shoots if their vigor permits it.

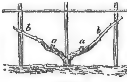

Fig. 57.

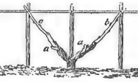

Fig. 58.

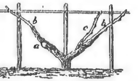

Fig. 59.

The adult age of the vine is represented by Figures 57–62. The vine (Fig. 57) of below the ordinary vegetation is pruned thus: on the right arm is an *aste*, *b*, of five buds, and a *côt*, *a*, of two buds; the left arm bears a *tiret*, *c*, of four buds, with a *côt*, *a*, of two buds.

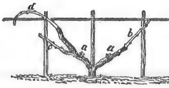

Fig. 60.

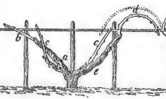

Fig. 61.

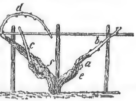

Fig. 62.

The vine (Fig. 58) of ordinary vegetation bears the same as the preceding; an *aste*, of four or five buds, and a *côt* of two eyes on each arm. The vine (Fig. 59) a little older and more vigorous, bears on its right arm an *aste*, *b*, of five buds, with a *tiret*, *c*, of three buds; and, on the left arm, an *aste*, *b*, of five buds, and a *côt*, *a*, of two buds.

Figure 60 represents a vine twelve years old, and of good vegetation, bearing on its right arm an *aste*, *b*, of seven buds, and a *côt de retour*, *a*, of two buds. The left arm has a flexible *aste*, *d*, of eight buds, a *tiret*, *c*, of three buds, and a *côt*, *a*, of two buds.

The vine in Figure 61, eighteen or twenty years old, is very vigorous; on its right arm there is a flexible *aste*, *d*, of ten buds, and a *tiret*, *c*, of four buds. The opposite arm has an *aste*, *b*, of seven buds, a *tiret*, *c*, of four buds, and a little *œil de retour* of only one bud.

Figure 62 represents the same vine as Figure 61, only some years older. The right arm having grown too long, has been amputated at the point *e* (Fig. 61), and the former *tirette* become an *aste*; a *côt* (*a*) of two buds, well situated, will serve, ere long, as the base of a *tirette*. The left arm bears a flexible *aste* which will have to be amputated before long at the point *f*, which will make the two arms even.

It is customary for the flexible *aste* to be fastened to the wire beyond the vine as shown in Figure 61 and by the dotted line in Figure 62; however, when two flexible *astes* come together and cause a confusion, it is preferable to train them as represented in our figures.

The figures of this chapter are drawn on a scale of four centimetres for every metre; that is, about one and three fifths inches for every forty inches. As you see, the vines of Médoc, pruned and trained, have the form of an open V. The *astes* and *tirettes* should always be pruned rather long, so that they may be easily fastened to the wire, and the superfluous buds carefully suppressed.

The *astes* should not have too great an inclination, as in Figure 55, because the grapes would be too near the ground, and would be in danger of being covered over during cultivation of the soil. The vines represented by Figures 59, 60, 61, and 62, have the proportions and inclination that constitute good culture.

The forking point, established at a suitable height, must always be taken good care of, and when shortening an arm that has become too long, the amputation should not be effected too near this fork.

Some persons may argue with us on the possibility of this pruning and maintaining the vine in the regularity we describe. With the experience gained from long practice, we assert that this regularity is easy to obtain in vines not subjected to the serious effects of Spring frosts.

With the precautions given, the fork of the vines may be assured at within about four fifths of an inch of the height adopted. We know that in the Spring the old wood on every vine is covered with shoots which have to be taken off. If this operation is performed by intelligent workmen, they reserve, on the vines that need them, some shoots properly situated to form *côts de retour*, with an eye to subsequent pruning.

It is the custom in Médoc to top the shoots at a certain height above the wire with the pruning knife. This operation has the advantage of rendering cultivation easier and assuring air to the grapes. The shoots, not being supported by stakes, would finally interlace and form a complete tangle, in proportion to the vigor of the vines. In some localities the shoots are topped too much; we advise doing it with the greatest circumspection; for it must not be forgotten that every suppression of the foliaceous part of a plant impoverishes it.

As in all the preceding methods, the removal of the shoots developed on the old wood must be effected about the end of May; only those necessary for the establishment of *côts de retour* are spared.

The varieties cultivated in Médoc are, for the finest: the *cabernet sauvignon, cabernet gris*, or *cabernet franc, carmenère*, and *petit verdot*, the last two not being cultivated very much. Those chosen as next in rank are the *merlau* and *malbec*, which, in certain localities, is designated under the name of *gourdou*. Nothing poorer than these two last named varieties, which are the best of our ordinary varieties, should be cultivated in this privileged country; unfortunately this is not the case, for in many vineyards commoner varieties than the *malbec* are to be found.

Among the great (*crus*) growths, the *cabernet sauvignon* is the only variety cultivated, and proves satisfactory. Only *cabernets* and a light proportion of *petit verdot* should be cultivated in vineyards of finest quality.

In second class vineyards the proportion of *merlau* and *malbec* taken together should not be more than one fifth; all the other varieties should be banished from Médoc as the *enrageat* is from Sauternes.

Médoc is not the only place where this method of pruning and culture is attended with success. It gives excellent results wherever it is intelligently applied to choice varieties planted in suitable soil. We shall simply cite as examples the domain of Château-Lognac, at Portets, and the domain of Pape-Clément, at Pessac, situated in localities where there is much room for improvement in the usual method of pruning adopted.

We are convinced that this method of culture would be very advantageous for the *graves* in the environs of Bordeaux. There the varieties are generally well chosen, but the pruning is almost everywhere detestable. By the adoption of a systematic method, a vine-grower would arrive at a satisfactory result more easily than by seeking to perfect the method used in that country, which is not based on any principle and is of no advantage to him. In general, the vine-dresser prefers to adopt a new method rather than modify the one he has always used, and which he pretends to understand better than any one else.

CHAPTER VII.

PRUNING WITH UNILATERAL CORDONS ON IRON WIRE.

The method of pruning vines with unilateral cordons trained on iron wire, we have already said, is our invention. We have practiced it on our estate in La Réole for the last twenty years. It is simple, methodical, and very easy to comprehend and apply.

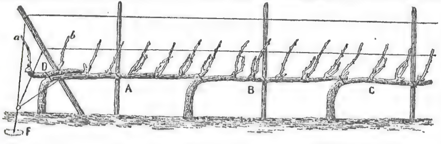

Figure 63, which represents part of a row of adult vines, gives an idea of this method. The vines are planted about six and a half feet apart; each one forms a sort of a trellis the length of these six and a half feet, and the extremity so rests on the neighboring stock. Thus there is a continuous *cordon* the whole length of the row. On this *cordon*, at regular distances, are little branches, which we call arms. These arms are very similar to those found in the bottom-land method; they are pruned and brought back to the *cordon* according to the same principles; their conformation is the same, since they are generally composed of an *aste* of five buds, a *côt cabaley* of three or four buds, and sometimes a little *côt* or *œil de retour* of one or two buds.

These vines are trained, as we see, on three iron wires supported by stakes put between the vines. The lowest iron wire supports the *cordon*; the middle one, the *astes*, and the shoots are fastened to the top one.

The iron wires are supported at both ends of every row by a strong stake put into the ground with the inclination shown in Figure 63. These wires are passed through little holes made in the props for this purpose, and are then fastened to the eye of a ringbolt (*F*), firmly fixed in the ground. This ringbolt is made of galvanized iron wire, No. 18, attached either to a stone, a heavy brick, or else to a piece of wood prevented from decaying by some means.

We use only black iron wire, No. 16, annealed with wood; it is expensive, but as it is of very superior quality, it is the most economical in the end. The iron is fastened to the stakes with staples.

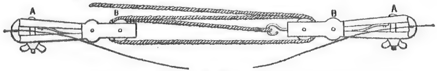

FIG. 64.

To stretch the iron wire we use an apparatus of our own invention, patented by us in March, 1861. This apparatus is to be found at nearly all hardware merchants.

This apparatus (Fig. 64) consists of two hand-vises, (*A*, *A*,) to each of which is adapted a pully (*B*), constituting a block and tackle. Figure 65 gives a side view of these vises, with their pulleys.

To tighten an iron wire, the ends of which have been fastened, each of the two vises are firmly fixed at any place on the wire, the two being about two or two and two-thirds feet apart, the block and tackle is manipulated and the desired tension is obtained without effort. In long rows the necessary tension is not always obtained at one trial; when the two vises of the apparatus are brought together, and that is not sufficient, the wire is kept at the point of tension obtained by being held thus with a hand vise (Figure 66):

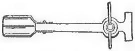

FIG. 65.

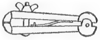

FIG. 66.

One of the vises of the apparatus is moved a little farther back and the wire is tightened as much as necessary. The iron wire stretched as desired, a ligature is made by means of two eyelets; or better still, if the iron wire is of good quality, it is cut and the two ends lapped about four inches, two little vises (Figure 66) are applied to this intersection, the heads facing each other a little over two inches apart, the stretching apparatus is removed and the ends of the wires twisted together by turning one vise to the right and the other to the left, which makes a very nice and firm ligature. We will not dwell longer on the subject of this apparatus, persuaded that it is well known and has been used by the majority of our readers.

In using this apparatus, if there are only two iron wires, it is immaterial which one is stretched first; but if, on the contrary, three wires have to be used, it is important to tighten the top one first, the lowest next, and the middle one last, taking care not to tighten it more than the two preceding ones.

The height of the *cordons* above the ground varies somewhat, according to the locality. In our culture of La Réole, where the vine is not subjected to frost, after divers experiments we finally adopted the height of twenty inches as being the most advantageous. In places where the vine is subjected to Spring frosts, this height may be raised to about three feet, in order to diminish their effects. The only inconvenience in this arrangement is that the vines are more exposed to the wind, and firmer stakes are required.

The distance between the different wires is: fourteen inches between the lowest one supporting the *cordons* and the center one, and sixteen inches between the latter and the top wire—say thirty inches in all between the lowest and the highest.

All our stakes are of chestnut or locust wood; it will be readily understood that it is best to use only wood that is as imperishable as possible, in order to economise in hand labor, always expensive. Good stakes, firmly planted, sometimes last for ten years without having to be touched, which is a matter of great advantage.

In the *cordon* method, as in the others, the first pruning is executed according to the principles recommended in Chapter I (general principles of pruning).

The second pruning is executed the same as the second in the Saint Macaire method, when the vines are prepared for the fork that is formed the next year (Chapter III); that is to say, a single cane is left, topped at a height of about one foot above the ground, on which only the two or three upper shoots are allowed to develop.

As the *cordon* is to be established the following year, it is well to use some precaution to make sure that the canes will be sufficiently developed and ripened when it is time for the *cordon* to be formed; for we have found this manner of working to be of great advantage.

In order to facilitate training the shoots which develop on this cane, it is necessary to use iron wire supported here and there by stakes. This iron wire is arranged as represented in Figure 67; it should be put where the top wire is to be the following year, to avoid extra trouble; in our vineyard, the *cordon* being established at a height of about twenty inches, the top wire is a little over four feet—about fifty inches—above the ground. This height may vary, as we have already said.

The end stake at *D* should be well chosen and put in to stay. The holes for the other two wires may be bored into it. Then, too, a stake must be put at every vine to support the stock, and for the young shoots to be tied to until they are long enough to reach the wire. These stakes, *C*, *C*, (Fig. 67), must be well in the vine row, and on the side of the vines opposite to that on which the *cordons* are to be extended; that is to say, if the *cordons* are to be directed towards the north, the stake will have to be put on the south side of the vines. We will explain the reason for this further on.

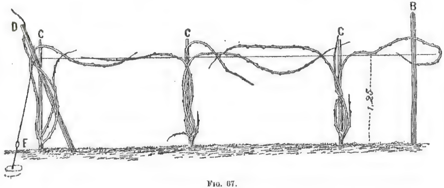

FIG. 67.

The young vines pruned and cared for as we have just advised will have the aspect of Figure 67, the following Autumn, and their canes will be in excellent condition to make *cordons*, which is all there is to be desired. (Fig. 68.)

To arrive at this result the young vines are pruned, leaving only the cane, in which are combined the best conditions of length, vigor, and direction. We repeat that a cane of medium size is preferable to a very vigorous one. Then the stakes are put in, and the iron wire put in place, observing the distance previously mentioned—that is, fourteen inches between the lowest and the center one, and sixteen inches between the latter and the top one.

By Figure 68, we see that the stakes *D*, *D*, which support the vines, are put at equal distances between the vines; placed about three feet from the vines they do not interfere with the roots, and have the additional advantage of supporting the *cordons* in the middle, thus being of great service when the vines are loaded with fruit; the extremity of the *cordons* is supported by little stakes, *d*, *d*, or rests on the bend of the next vine, when the stock has become strong enough for the little stake to be dispensed with.

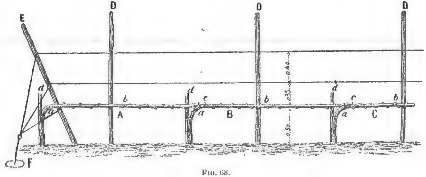

FIG. 68.

A little stake, *d* (Fig. 68), is put at each vine to keep it well in line, guard it from the plow, and facilitate the bending of the *cordon.* This little stake must be high enough to reach the first wire, but there is no harm in its being as high as the top wire. It must always be opposite the bend *a*, and may be dispensed with three or four years after the installation of the *cordons*, when the bend is strong enough to support the extremity of the neighboring vine, which must be fastened to it, as seen by Figure 63.

The wires stretched and the little stakes, *d, d*, put in place, we proceed to tie up the vines. First, we begin by fastening the stocks to the little stakes in two places, taking care that the top binding is about four or five inches below the first wire. The vines are carefully curved at *a, a*, so that the bend is neither too angular nor too open. Then the *cordons* are fastened to the wire in a sufficient number of places to keep them perfectly straight. The canes forming the *cordons* should, if long enough to permit it, lap about four inches on the bend of the next vine, as seen in Figure 68.

It is very essential the first year the *cordons* are installed not to bind them too tight, and the binding used in fastening the *cordons* to the wire must never be wound around twice, as that would be very injurious to good circulation of the sap. It would even be well to examine the young *cordons* about the end of August and cut the ligatures that are too tight, and which, as frequently happens, cause swellings, especially towards the extremity of the *cordons.*

As soon as the young *cordons* are properly bound to the wires, all the useless or superfluous buds are removed, to compel the sap to flow in preference to the shoots that are to constitute the *astes* the following year.

These *astes* having to be established the whole length of the *cordon*, at as regular distances as possible, it is essential for the buds to be developed very regularly on the *cordon;* hence it is well for them not to be too numerous.

The distance between the buds on canes of ordinary vigor being in the neighborhood of three inches, it will be sufficient to leave only half of the buds on young *cordons*, suppressing those on the under side in preference. In addition, all the buds from the ground to at least ten inches beyond the bend of the *cordon* must be suppressed.

When the canes forming the *cordons* are very vigorous, the buds are very far apart; in this case all the eyes are left, or only those suppressed that are situated as just described in the case of less vigorous canes. This remark applies also to certain varieties presenting the same phenomenon.

After disbudding the young *cordons*, every vine will have only about a dozen buds, at regular distances; the young shoots developed will have to be carefully fastened to the center wire as soon as they are long enough.

The first year the *cordons* are established, the viticulturist must endeavor to have the vegetation on every vine regular, that all the eyes which have not been suppressed may develop with about equal vigor.

If all the shoots of the same vine develop with equal vigor, which is somewhat rare, there is nothing to do but to fasten them to the top wires as they lengthen sufficiently. Generally it happens that one or two shoots nearest the bend, and those at the extremity of the *cordon*, develop with more vigor than the others; in this case, to restore uniformity in the vegetation, we need only to pinch the extremities of the vigorous shoots, which drives the sap to the feeble ones, and by this means the latter will catch up with the others before they start anew. This pinching nearly always suffices to regulate the vegetation. It must be done only about the end of May, or in June, when the vine is well started and the vigorous shoots are about twenty inches long.

The vegetation of some vines is very irregular; the buds will not develop evenly without energetic treatment; hence, it is essential to watch the young *cordons*, and if all the buds have not developed when the vegetation is well started, all the most vigorous shoots must be pinched pretty severely. The backward flow of the sap would cause the feeble buds to start. In general, once pinching the most vigorous shoots suffices to equalize the vegetation. However, it is advisable to examine the vines again a month later to repeat this topping of the too vigorous shoots.

It is readily seen that pinching is necessary, but should never be executed in a general way, as many people think. It is well to do it on young vines, with the sole aim of regulating the vegetation. It is also necessary to do it with adult vines, as will be seen farther on, to prevent the shoots at the extremity of the *astes* from becoming too vigorous, to the detriment of the lower shoots, which alone are useful for future pruning.

Many viticulturists abuse this practice. They think that by pinching all the shoots at the time of florescence, they prevent *coulure.* This is a serious mistake; they thus favor the development of the most vigorous shoots, which start first and absorb all the sap. Others sucker to excess, in order to give air to the fruit. This practice is equally bad; by too radical suckering a great quantity of young leaves are taken off, which stops the regular elaboration of the sap. The roots, as well as the whole organism of the plant, suffers from this. It would be preferable to sucker them frequently, taking off only a little each time.

If a pretty severe frost or hailstorm should occur the first year the *cordons* are established, there would need be no hesitation as to pinching the shoots severely, so as to induce the development of young shoots below the bend of the vines. These young shoots would have to be carefully taken care of, so that they may take the place of the old *cordons* the following year.

It is important that the development of shoots on the young *cordons* should be all that is desired, in order that at the following pruning the *astes*, which will constitute the arms, may be installed with the regularity seen in Figures 63 and 72. Figure 69 represents the vegetation of well-trimmed young *cordons* the first year of their installation.

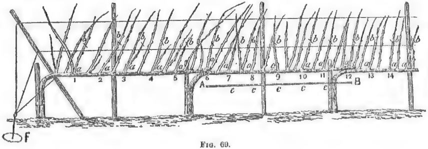

Fig. 69.

Choosing the *astes* is an operation demanding unremitting attention on the part of the vine-grower, if he wishes to obtain regularity.

A vine-row is composed of a succession of vines arranged as represented in Figures 63, 70, and 72. These vines form an uninterrupted *cordon* on which are situated, at very regular distances, arms which must be treated as little single vines.

These arms are about a foot apart. The vines being about six and a half feet apart, each of them consequently has, on an average, six arms. This arrangement and distance between the arms are necessary to avoid confusion, and to make the canes as well as the grapes ripen perfectly. After the development of the vegetation the fourth year, that is to say, the year following the installation of the cordons (Fig. 68), the vine, when the time for pruning has come, presents the aspect of Figure 69, which shows us two four-year-old vines of the *malbec* variety, vigorous, and of regular vegetation.

The pruning now in question is the most difficult, or, to speak more correctly, the one deserving of the greatest attention on the part of the workman. The arms once established never have to change their place, hence it is important in choosing the *astes*, to see that they are at the right distance from each other.

By Figure 70 we see that the last arms, *c, c*, of each vine are on the extremity of the *cordons*, and rest on the bend of the next vine; hence, if we wish to observe the regular distance of about one foot between the arms, the first arm of the next vine must be about sixteen inches from the perpendicular of the stock. This arrangement is advantageous, because if the first arm was too near the bend, the sap would be carried there in too great abundance, so destroying the equilibrium of the arms of the several vines.

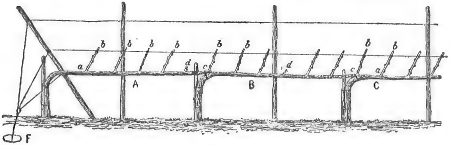

Fig. 70.

The place of the first arms, *a, a*, as well as the last ones, *c, c*, of every vine being determined almost mathematically, it is very easy to fix the position of the other four.

If a person has not had some practice in this work, he can do it with precision by means of a gauge *A, B*, (Fig. 69), on which is marked the divisions, *c, c, c, c*, indicating the distance to be allowed between the arms.

When pruning the vine-grower can make use of this gauge, which indicates, without his experimenting, the canes best situated to serve as the basis of each arm. In the case of very important vineyards, the choice of shoots that are to form the arms might be made by an intelligent workman, who, gauge in hand, would mark those that have to be reserved, either by topping them with the pruning shears, or putting a little paint on them. Experience has proved that one man can mark out the work for four or five workmen, and thus shorten their task very much. The gauge must be applied close to the *cordon*, the end *A* opposite the bend of the vine, that is to say at the last *aste* of the preceding vine. The figures 1 to 14 (Fig. 69), indicate the shoots that are to form the arms. They must be topped so that they can be easily fastened to the second wire. All the other shoots will be suppressed close to the *cordon* as neatly as possible. As the arms do not have to be displaced while the *cordon* lasts, it is desirable that no other shoots should develop on the *cordon*. That is why we insist that all the shoots, excepting those left to form arms, including those at the crown of the base, should be radically removed.

The first year of the installation of the arms, every one must be topped at *b, b, b*, and attached to the second wire, as in Figure 70. The cane *d*, which is to form the fifth arm of the first vine (same figure), not having acquired sufficient development, is pruned as a *côt* of two eyes; an accident happening, during pruning, to the cane that is to form the third arm of the second vine, that also has to form a *côt*.

This first year only from three to six buds need be left on each arm, according to the vigor of the vines. It is well to remove the superfluous buds at the time of pruning, taking care not to leave too many on the arms, so as to compel nearly all the important ones to start with a certain amount of vigor. It will be readily understood that, if a great majority of the buds develop vigorously, it will be easy, by means of pinching, to establish perfect equilibrium between the arms. It is also important, at this pruning, to do away with all the old ligatures that are too tight, which would impede the circulation of the sap.

It sometimes happens that the cane forming the *cordon* cannot reach the next vine; in this case the arms are installed on the first part of the *cordon*, and the latter is prolonged by means of a cane in good position, which is fastened to the next vine and disbudded like a one-year-old *cordon*. (See Fig. 71.) Then less buds are left on the arms, and they are pinched a little more severely to oblige the sap to flow to this prolongation.

Figure 71 represents three vines which, the first year, were not long enough to reach the bend of the neighboring vine. The dotted lines in the figure indicate the arms that are wanting, and which must be installed the following year; it is essential to pay careful attention to the shoots destined to form them.

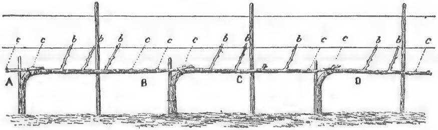

Fig. 71.

The bend of the first vine of each row is bare, as there is no *cordon* to be supported by it; this fault is remedied by having a cane, *c*, come from the base of the first arm (Fig. 72), which lies horizontally on the *cordon* towards the end of the row; the following year two arms are left on this cane at the dotted lines, *b*, *b*, thereby filling the empty space, as shown in Figure 63 at the beginning of this chapter.

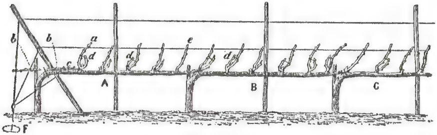

FIG. 72.

While the vines are young, and especially in the case of certain varieties, we must not neglect to tie up the shoots, so as to keep them from being injured by the wind. Such accidents are always unfortunate, but especially when they happen to the shoots necessary for the formation of arms.

This first year of the establishment of the arms the pinching is executed as follows: About the end of May, when the clusters of young grapes are well formed, the weather warm, and the development of the vegetation well under way, one or two of the shoots at the top of every arm is pinched close to the last bunch of fruit. This operation is to strengthen the lower shoots, which must furnish the elements of the next pruning. Pinched off close to the fruit the shoots do not start out again, or only very little; they nourish their fruit as well as though they had not been pinched, and the sap necessary to the others is not wasted on them.

When the arms are regularly established, such assiduous care and intelligence are no longer required in pruning the vine. The vine-grower has little to do excepting to prune the arms, which may be considered as so many separate vines planted on the *cordon*. If the *cordons* and arms have been regularly installed as we have described it is an easy matter, excepting in very rare cases, to maintain uniformity in the vegetation of the six arms on the same vine; we are sure that the vine-grower could easily remedy any accident that might happen.

Having given the method of forming the young *cordons*, it remains for us to study the pruning of the arms, which, as we said before, should be considered as little vines planted regularly along the *cordon*.

This pruning is very simple: the same rules are observed as in pruning the arms of the bottom-land vines; as in that system, we shall call the principal branch *c*, the *aste;* the secondary fruit branch *b*, the *côt cabaley*, and the little *côt* of one or two eyes, *a*, the *côt* or *œil de retour*. (See the arms in Fig. 80.)

It is essential to see that these arms do not become too long; they should be cut back as near as possible to their base, near the *cordon*. This result will be easily obtained if too many shoots are not allowed to develop on the arms, and if they have been regularly pinched.

Imbued with these principles, we will take a young arm recently installed and having seven buds, *a*, *b*, *c*, *d*, *e*, *f*, *g* (Fig. 73). At least five buds, *c*, *d*, *e*, *f*, *g*, will start when the vegetation of the vines begins to develop; the shoots *f* and *g* will be pinched close to the last bunch of fruit as soon as the latter is well formed, which occurs about the end of May; this operation is to provoke the development of the bud *b*, and perhaps of the bud *a* too. Figure 74 shows the shoots of this arm, established on a very vigorous *cordon*. Figure 75 shows us the same arm established on a less vigorous *cordon*, and its vegetation indicates plainly that in this case too many buds were left on the arm.

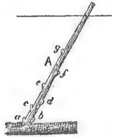

FIG. 73.

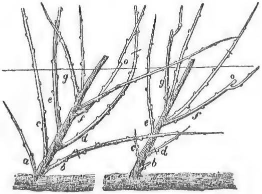

FIG. 74. FIG. 75.

To prune the arm (Fig. 74) the *côt cabaley* is left at *b*, the cane *d* forms the *aste*, and the cane *a* is cut very close to the arm; all the others are suppressed. This arm is shown pruned and trained in Figure 76; the *aste d* has six buds and the *côt cabaley b* three buds.

The arm (Fig. 75) having been overcharged, must be sparingly treated; we shall leave on it only an *aste* of four buds on the cane *f*, or the other shoot coming from the same eye; a *côt* of two buds on the cane *d*, and a little *côt* of one eye on the cane *b*. This arm is shown pruned and trained (Fig. 77).

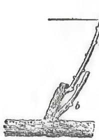

FIG. 76.

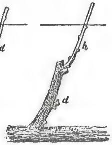

FIG. 77.

As we said before, the arms (Figs. 74 and 75) installed on different *cordons* show the result of the vegetation of the pruned arm (Fig. 73). One has put forth its new wood with much vigor, and has been pruned in accordance with this excess of vegetation. The other, having vegetated poorly, has also been pruned accordingly. The arm in Figure 76 has seven very fructiferous buds, five of which are on the *aste* and two on the *côt cabaley.* The arm (Fig. 77) has only four buds which may be considered fructiferous.

Figure 78 shows the new wood developed by pruning an arm established on an adult *cordon.* Pinching the two principal top shoots at *o, o,* has caused several fructiferous counter shoots to develop, which have yielded fruit; this operation has also strengthened the new wood on the *côt cabaley.*

Pruning this arm is a very simple matter; it may be confined entirely to the *côt cabaley,* suppressing the old *aste;* the *aste* for this year may be formed from the cane *c,* situated on the old *aste;* this depends, though, on the vegetation of the vine in general. If all the arms of the vine are of about the same vigor, an *aste* of six buds will be left on the cane *c,* a *côt cabaley* of three buds on one of the canes coming from the old *côt cabaley* and growing in the right direction, and a little *côt* of one year on the small shoot *a.* If this arm was more vigorous than the others established on the same *cordon,* there would be no need of hesitating to cut back the old *aste* and leaving only one *aste* on one of the canes coming from the *côt cabaley* with a little *côt* of two eyes on the cane *a.*

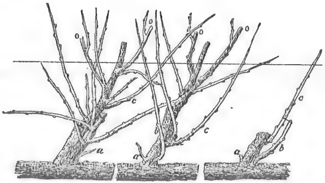

FIG. 78. FIG. 79. FIG. 80.

Figure 79 shows the development of vegetation on the pruned arm (Fig. 77). The two upper shoots of the *aste* having been severely pinched at *o, o,* close to the last cluster of fruit, the sap has been driven back, and the buds of the two small lower *côts* have developed well. The vegetation of this arm, which, the preceding year, fell far short of the mark (See Fig. 75), has been completely reëstablished, by means of a moderate charge and by pinching the two upper shoots of the *aste.* By so doing, some of the vintage has been sacrificed; but the subsequent vintages will make amends for this momentary loss. In pruning this arm (Fig. 79), an *aste* of five or six buds, according to the vigor of the vine, is left on the cane *c,* and a little *côt cabaley* of three or four buds on the cane *b.* The little cane *a* has been pruned to one eye. This wood is useless in the present case, *côt cabaley* being very near the *cordon,* and moreover it is not in a good situation; hence there would have been no harm done if it had been passed altogether; but if the canes were higher up from the *cordon* it would not do to neglect leaving it. When an *œil de retour,* as in this case, is situated in front of the arm, that is on the side towards the bend of the vine, it must be pruned to one or two eyes, according to the disposition of the buds. It is indispensable for the top bud to have a natural tendency to develop in the direction of the inclination of the *astes,* or at least in a vertical direction. If the first bud, near the old wood, has this tendency, only that one must be left; in the opposite case, the second one is left and the first one suppressed. We insist on this little matter, which might seem too circumstantial to many of our readers; but if we wish our *cordons* to come up to the mark in regularity, the smallest point must not be neglected. It is especially requisite that the workman who does the pruning should understand the value of all these remarks. When he has once fallen in the habit of observing these points he will be no longer in accomplishing his work than if he had taken no account of them.

As in all other methods the intelligent vine-grower should have three things in view: First, the shape, or, in other words, good direction of the arms; second, the equilibrium of all the arms on the same *cordon;* third, the number of buds that should be left on the arms of the same vine.

To maintain the shape, or good direction of the arms, the *côts de retour* must be well situated; on them depends the whole system of the arms; it is important that the buds that furnish these *côts de retour* should be in the right place; it is preferable to prune one and even two years on a long *aste* rather than leave a *côt de retour,* which would not combine the necessary conditions, and which, moreover, would hinder the development of other shoots better situated.

The equilibrium of the arms of the same vine is maintained by leaving less buds on the very vigorous arms by cutting back the feeble shoots found on them, or else by pinching the shoots of the vigorous arms more severely. In some cases several of these means must be employed at the same time.

As for the number of buds to be left on the arms of the same vine the vine-grower must not forget that fertile varieties must be charged less than fine varieties; that a great many buds must be left on vines growing in fertile soil, if they are vigorous, while those in poor soil must be spared. After first taking into account the preceding pruning, which can be done at a glance, the charge must be augmented if the vegetation has been too vigorous, and lessened if the vegetation has been feeble, and if too many of the buds have proved abortive.

By taking care to renew the arms frequently, that is to say, cut them back near the *cordon*, we avoid making severe amputations, which is an important matter; the latent buds on relatively young wood develop better than those on old stumps which do not come to anything. Moreover, we have found that *astes* situated on newly formed arms are more fructiferous than those on too old ones, hence it is well to cut the arms back every three or four years.

It is very seldom, during a period of two or three years, that some well situated shoot is not developed at the base of the arm near the *cordon;* it must be pruned to one or two eyes, taking care that the top bud is inclined to develop in the right direction, as we said before. The following year the *côt cabaley* is left on this *côt de retour;* two years after the establishment of the latter, all the wood used in pruning is installed there, and the other parts of the arm suppressed.

When an arm has grown too long, is of bad shape, or not well situated, there must be no fear of leaving a *côt cabaley*, or even an *aste*, on a branch developed on the *cordon* at a suitable point; then the faulty arm is cut back as soon as possible, that is, when the new arm is well established. In such cases this *aste* or *côt cabaley* is only moderately charged, so that all the eyes left on it will develop; it must be pinched if necessary.

All the *astes* should be fastened to the center wire, with a slight inclination in the direction given to the *cordons*, as may be seen by the divers illustrations of this chapter. The *côts cabaley* must be attached to their *aste.*

An excess of vegetation is injurious to fructification; that is why we must not fear to charge a very vigorous vine; it cannot be killed or impoverished in one year; if it yields a quantity of fruit, we profit by it; if its vigor is affected, we lighten its charge the next year. On the other hand, a vine overcharged dwindles, and its fruit is light colored and of bad quality; overcharging it several years in succession may even prove fatal to it. Consequently we must, as far as possible, keep to the just medium, and not fall into these errors.

All the wood developed between the arms must be cut back as close as possible, as well as the shoots put forth in bad situations at the base of the arms; if among the latter there were some well situated, but not needed at the time for *côts de retour*, they would be pruned crown fashion. The swellings, or the points where the shoots start from the old wood, are garnished with a multitude of eyes, which it is well to spare when they are properly situated. These reserves are useful for future pruning.

When, in consequence of a very heavy hail-storm, a disastrous frost, or some other cause, the *cordons* are mutilated or robbed of their arms, they are easily reformed. For this purpose, when ridding the vines of suckers in the Spring, one that is well situated must be left at the foot of each vine; the following year it is pruned to three or four buds, just as is done at first in preparing the vine for the regular shape to be given it at the next pruning. However, the old *cordon* is still left on the vine, and is pruned as well as possible, so that it will bear fruit, without paying attention to its regularity during the time that elapses before it is cut off. The canes left at the base of the stocks should be supported by rather long stakes, and only two shoots allowed to develop on them; these shoots must be fastened to the top of the stakes. The next year all the old vines are cut down and new *cordons* formed from the canes prepared as we have just described.

Our oldest *cordons*, some of which are ten inches in circumference, were very much affected by the severe Winter of 1870–1871. The snow remaining on them for so long froze many of the arms, which obliged us to form new *cordons*. They were reconstituted by the method we have just explained. They now present as regular an appearance as those five or six years old.

The younger *cordons*, that is those under twelve years of age, did not suffer from the cold, and not one of their arms was injured.

If, in consequence of an accident, one of the arms of the *cordon* is lost and no other comes in the same spot, it is replaced by taking a suitable cane, developed at the base of the preceding arm, which is inclined horizontally along the *cordon;* only one or two eyes, situated just about where the new arm is to be installed, are allowed to develop on this cane. The next year the best situated cane is taken for the new arm, and is then pruned as though it came from the *cordon* at that spot.

Vines pruned *à cordons* must be pinched every year. This operation is performed about the end of May or the first part of June, when the fruit is well formed and the vegetation in its prime. This work is elementary, and may be done by women or children; one or two of the very top shoots of every *aste* are pinched close to the last bunch of fruit; generally there are two *astes*, never more than three. The shoots to be pinched are easily recognized, situated as they are at the top of the *aste*, and surpassing all the others in their vegetation.

These shoots would be of no advantage for future pruning, and would absorb a great quantity of sap to the detriment of those at the base of the *astes* and of the *côt cabaley.* Pinching close to the fruit does not injure the grapes, and, moreover, provokes the development of shoots that would otherwise remain stationary; these shoots yield their share of fruit; they augment the production materially, and at the same time are useful as wood for pruning, for the shoots at the base of the *aste*, of the *côt cabaley*, and the *côts de retour*, are the ones most benefited by the pinching.

The method of pruning with unilateral *cordons*, well executed, is incontestably the best of all those practiced in the Gironde. No other system is more favorable to the exigencies of vegetable physiology; the sap circulates freely in a single branch to be distributed equally among all the arms of the same vine. No other form presents this mathematical regularity in the arrangement of the fruit branches, nor this symmetry that permits of having so great a number of the latter without any confusion.

The length of the fruit branches is not exaggerated as in some methods, and yet is sufficient to render fine varieties fructiferous. In consequence of the pinching the shoots are numerous and develop with about the same vigor, which is one proof of the perfect distribution of the sap. Then the grapes are spread out over a very large surface, where they can enjoy, although so numerous, the amount of air and sunlight necessary for their good maturation. They produce excellent wines, as long as the soil is suitable and proper varieties are cultivated.

The rows being very straight and the arms always maintained in the proper direction, cultivation of the soil is easy, and but little left by the plow for cultivation by hand, which is a point of economy in this work.

Firm stakes and good iron wire are expensive, but the most advantageous in the end, for they last a long while and greatly diminish the amount of hand labor.

We began to use this method of pruning *à cordons* in the year 1846; it was not until about 1850 that, after conclusive experiments, we applied arms to the *cordon* similar to those employed in the bottom land method. From this time on all our vines were trained *à cordons* in spite of the discouraging predictions of the learned men of our country; and we have never had cause to repent of thus transforming our vineyards.

We know very well that many vine-growers have condemned this method as impracticable in extensive vineyards. We assert that if they have failed in its application they should lay it to their inexperience or to the ill will of their workmen. However, it is not for us to sound its praises; for the edification of our readers we shall simply place before them, without comment, documents that we have received from various commissions or from the most competent viticulturists.

[N. B.—Here follows reports of meetings, etc., in which are discussed the merits of the Cazenave system of pruning, but which are too voluminous for this work.—TRANSLATOR.]

CHAPTER VIII.

THE GUYOT METHOD.

Dr. Jules Guyot rendered great service to French viticulture by bringing it to the notice of many intelligent men who otherwise would never have paid it any attention. In 1850 he planted out a vineyard in Champagne, in very poor soil, and applied a special method of pruning, and also of protecting his vines from frost. He obtained magnificent results.

In 1861 he was commissioned by the Minister of Agriculture to go through the divers viticultural departments of France in order to study the present methods of viticulture; to make known the systems whose efficacy had been established by experience and practice; to institute by his advice and instructions a desirable progressive movement; and finally, to make out a general report on the result of his observations and studies. Such was the ministerial programme. Dr. J. Guyot carried it out scrupulously in the seventy departments which he went through and studied, from 1861 to the end of 1867, when he was obliged to suspend his studies on account of ill health. His reports to the Minister of Agriculture are profound works, which will be consulted with advantage for a long time to come.

We shall not describe his method of protecting the vines from frost, which, to some extent, forms part of Dr. Guyot's system of culture. The latitude of the Gironde happily exempts us from this labor, which would not compensate us for the expense involved therein. We must consider that, with us, the high classed vineyards, which alone would be able to stand the expense, however little their vintage would be augmented thereby, do not suffer from frost frequently. Consequently we shall speak only of the system of pruning known in France as the Guyot method.

This method is based upon rational principles. It permits of obtaining, with vines planted in soil of average fertility, a relatively abundant fructification, provided the soil is kept in good condition by means of improvements. It is very simple; very easy to apply however little it may be studied. We shall describe it as it is explained by Dr. Guyot himself in his numerous letters.

The most suitable space to allow between the vines is about three feet in every direction; however, this distance may be diminished or increased.

The plants, as well as the stakes, must be in as straight a line as possible, to facilitate plowing. We simply mention this point, persuaded that our readers fully understand its importance.

Every vine must be treated, in its infancy, as described in the chapter on general principles of pruning; about the age of three years the vines are pruned to a single cane, leaving only three eyes, and taking care that the top bud is not more than ten inches above the average level of the ground.

This work done, a stake about five feet long is put at the foot of each vine. This stake serves as a support for the vine and as a means of keeping the latter well in line; it also serves to support the shoots which will be developed, and which must be carefully tied up.

The following year the vines must be installed as represented in Figure 81; every vine has a little *côt* (*a*) of two buds, and a fruit branch (*b*, *c*) of ten buds. The fruit branch is attached horizontally to an iron wire (*B*), stretched at about one foot above the ground; another wire (*A*), about sixteen inches above the first one, serves as a support for the shoots and canes. The iron wires are supported by the stakes *d*, *d*, *d*, from four to five feet high, placed at the foot of every vine, and by smaller ones (*e*, *e*) put between the vines. The latter are not indispensable, but they make the framework firmer, and permit using No. 12 wire for *B*, whereas otherwise it would be necessary to use No. 15, the same as must be used for *A*. The iron wires are fastened to the large stakes by means of tacks or staples; the little stakes (*e*, *e*) are simply fastened to the wires with osiers when tying up the shoots.

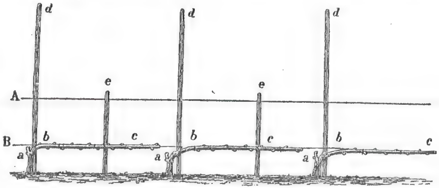

FIG. 81.

When the shoots begin to develop, all those put forth on the old wood must be removed, and also those on the fruit branch that would not bear grapes. As the shoots of the fruit branch attain sufficient length to reach the wire *A*, they must be fastened to it; they must all be pinched at the second leaf above the top bunch of grapes, or a little higher up if necessary, in order that they may be long enough to reach the wire. The two or three shoots which will develop on the *cóts a, a, a*, must be carefully fastened to the stakes *d, d, d*, without being pinched; they may be topped above the stakes, towards the end of vegetation, when the development of lateral shoots on these canes is no longer feared.

The long fruit branch requires to be trained horizontally, in order that the sap may be distributed without difficulty to every shoot. It frequently happens that at the beginning of vegetation some shoots are backward, while others develop rapidly; sometimes pinching suffices to regulate the vegetation; however, the vines must be inspected frequently to repinch the shoots, which, having been pinched already, would start out again too vigorously, and also to pinch those which, being backward, could not be subjected to this operation before.

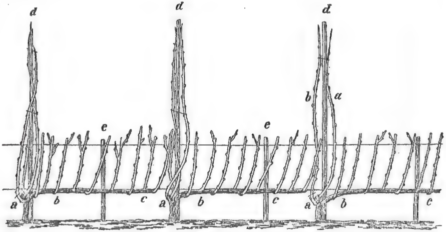

Fig. 82.

By proceeding as we have described, the vine will have the aspect of Figure 82 in the Autumn of the year, when it is first trained on the iron wires. The vine assumes its perfect shape this first year. Consequently, from this time on, the pruning is the same.

Let us take an adult vine, after the fall of the leaves (Fig. 83). To prune it, the fruit branch, *b, c*, of the preceding year must be cut off at the point *j*, and only the three canes, *f, h, g*, left on the vine. The cane *f*, being the lowest, must be pruned, to form the *cót* of two eyes, at the point *i*; then the worst situated of the two canes, *g* and *h*, must be suppressed; as for the remaining one it must be pruned for the fruit branch to a number of eyes proportionate to the vigor of the subject.

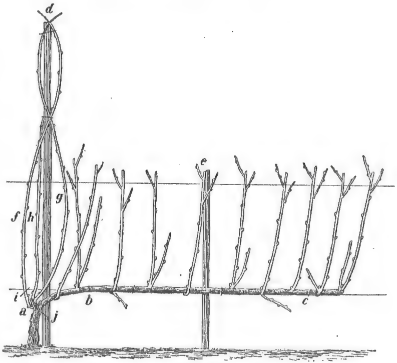

Fig. 83.

The useless shoots on the adult vines are removed and the others pinched, as is done the first year the young vines are trained on the wire. All the shoots on the fruit branch are pinched to prevent their attaining too great development, to the detriment of the *cót* that is destined to furnish the wood for pruning the following year.

The height at which the fruit branch and *cót* should be installed above the ground, and which we have fixed at ten inches, according to Dr. Guyot's directions, might be augmented; we are sure that in some localities, chiefly in humid soils, the vines would only be benefited thereby; however, we must not lose sight of the fact that no matter how carefully we prune, the vines gradually become higher as they grow older, hence it is well to take this fact into account, so as not to start at too high a point. Whether the stock is high or low the principles of pruning are the same; if the vine is higher the stakes must be longer and stronger, therefore it is to one's interest to keep them low, if there is nothing to hinder so doing. The owner of the vineyard who is acquainted with his land can best determine the proper height.

When the head of the vine becomes too high, we leave on the stock, at a suitable point, a shoot which is pruned to one eye the first year; the shoots developed on it are pinched at the height of the top wire. The following year, the *cót* is left on this cane, and the fruit branch above on the *cót* of the preceding year. At the third pruning, the vine is cut down close to this *cót*, which must be properly pruned, and from this time on the wood for pruning will be found at the height at which it was established in the first place.

This method of pruning, as we see, is very similar to the Saint Macaire method. As in the latter, every vine has a long fruit branch and a *côt* of two eyes to furnish wood for future pruning. The difference between them is, that in the Guyot method the fruit branch and the *côt* are situated on a single arm; the first is inclined horizontally throughout its entire length, and the second is situated at its base; then all the shoots developed on the fruit branch must be regularly pinched. In the Saint Macaire method, the extremity of the fruit branch is bent over to form an arc or tortillon; the vine branches into two arms; the fruit branch is established on one and the *côt* on the other; moreover, pinching is not practiced.

With the Saint Macaire method, in good soil, a larger production is obtained than with the Guyot method; this is owing to the fact that, in the first method the framework of the vines is more developed, the fruit branch longer, and the vegetation less exhausted by pinching; but in soils of average fertility the Guyot method is preferable, both on account of its simplicity and the production; the fruit is better distributed and consequently has more air.

Then, too, the Guyot method is similar to ours the first year of its installation, since it has a long fruit branch horizontally inclined. The difference is that in the *cordon* method there is no branch for furnishing wood; that pinching is practiced only on a few shoots, and for the purpose of regulating the vegetation, whereas, in the Guyot method, all the shoots of the fruit branch have to be pinched at the second leaf above the top bunch of grapes, in order to drive back the sap to the branch which furnishes the wood for the next pruning.

Doctor Guyot has been a leader in viticulture, and we hardly dare to criticise his method of pruning. However, we shall be allowed to make several observations, the value of which has been proved to us by experience.

Doctor Guyot recommends doing away with every shoot on the vine that does not bear fruit; we also agree that it is of great advantage to clear the plant of all suckers developed on the old wood, and to sacrifice several shoots at the base of the fruit branch, if they have no fruit on them; but we consider it superfluous labor and also injurious to suppress all the shoots on the fruit branch that do not bear fruit. This operation would be a lengthy and difficult one besides being of no real advantage. A cane does not weaken the vine unless it is bearing; if, on the contrary, it yields no grapes, the sap elaborated by its leaves strengthens its roots, augments the vigor of the vine, and helps it to resist, later on, abundant fructification.

Pinching, such as Doctor Guyot recommends, is perhaps a little too severe; we recognize its utility in maintaining equilibrium in every part of the framework of the vine, but we object to excessive mutilation. Pinching, at the second leaf above the highest cluster of fruit, will perhaps do for certain vines, but this treatment is too severe for some others. For the same reason that we leave the non-fructiferous shoots on the fruit branch, which strengthen rather than weaken the vine, we shall find that it is more rational to pinch the vegetation of the fruit branch only enough to equalize the distribution of the sap, as we have recommended in the case of young *cordons* the first year of their installation.

Let us not forget that the number of buds to be left on the fruit branch must depend upon the vigor of the vine. If we have a vigorous subject, we may require it to yield abundantly without fearing loss of quality; but to assure its vigor, it is not necessary for us to mutilate the very organs from which its vigor is derived. Many people imagine that by severe pinching *coulure* is avoided. Our experience, as we have already said, has convinced us of the contrary.

Dr. Guyot pinches his fruit branch, in order to force the sap in abundance to the branch upon which he depends for wood for future pruning, the shoots of which do not need to be pinched. This branch, from its situation at the base of the fruit branch, is always sure of having enough sap for the proper nourishment of the two or three shoots developed on it. We prefer to have these shoots to be of very ordinary size and well directed rather than to have large wood for bearing fruit; hence we believe that a moderate pinching of the fruit branch is better than a radical pinching of all the shoots.

We would not recommend the Guyot method for very rich soil; the method used in the bottom lands, and the *cordon* methods, would be more advantageous there; but we are convinced that, properly applied, it would give excellent results in many vineyards of the *graves*, where, as we have already said, the pruning as a general thing is detestable.

CHAPTER IX.

THE CHAINTRE SYSTEM.

[N. B.—This chapter will be found in Appendix I of this report.—TRANSLATOR.]

CHAPTER X.

TRELLIS CULTURE.

There is no need to explain what is meant by a trellis. All our readers know that it is either an espalier, supported by a wall, or an arbor destined to give fruit and, at the same time, shade. Trellises are numerous in the Gironde, but they will be still more so. In the country, especially, there are few houses that cannot have this source of comfort and profit.

Unfortunately, with us, there are no rules followed in this method of culture. Free scope is given to the most fantastic imagination, and badly trained vines seldom give satisfactory results. Therefore, there is no particular method adopted in the Gironde for us to describe here. In this chapter we shall simply state what is done in other places, and tell what long experience has led us to appreciate and apply.

There is no place in France in which trellises are more renowned than Thomery, near Paris. We shall state briefly what is done there, and then make a few observations on the subject.

In Thomery the varieties chiefly cultivated are the *Chasselas doré* of Fontainebleau and the *Frankental*. The other varieties, being less in demand for consumption in Paris, are not cultivated here.

The vineyards of Thomery are covered with walls about thirty-three feet apart and about ten feet high. Each one has a little roof of plane tiles, forming a hood projecting about nine or ten inches. These walls support the trellises, the products of which constitute the wealth of this locality.

The space between the walls is occupied by counter-trellises, supported by wooden or wire lattice-work, on which the vines are trained; these counter-trellises are hardly more than three or four feet high.

To prepare for planting, the soil is cultivated to a depth of about three feet, and in strips about eight and one third feet wide. As far as possible this work is done in Summer, so as to plant in Autumn. Occasionally, however, it is done in Winter, to plant in the Spring.

In planting the vines are set out about sixteen inches apart, and a little over three feet from the wall. As soon as the canes are long enough they are brought over close to the wall by means of layering, and the next thing is to establish the *cordons*. The *cordons* are composed of two arms; generally there is a space of about eighteen inches between them, which permits of having five rows on every wall.

The walls are provided with iron wires stretched horizontally. The first wire is sixteen inches above the ground, and they are all about nine inches apart. The *cordons* are supported by the first, third, fifth, seventh, and ninth wires, and the shoots are attached to the intermediate ones.

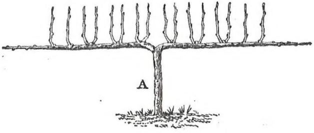

FIG. 99.

Figure 99 represents a *cordon* with two arms, trained on the wall. The stock, *A*, varies in length, according to the height at which the arms are established. The two arms are exactly the same length; if this were not so the longer arm would absorb the most sap, and would thus weaken the shorter. The spurs developed on these *cordons* are on the upper side, and at regular distances, that is about eight inches apart.

Every *cordon* has an extent of about six and one half feet, or a little over three feet on each side. This length is not obligatory; it is doubled, without inconvenience, if the soil is good, and the varieties vigorous, like the *Frankental*, for instance. However, we should not go beyond certain limits in the total length of the *cordons*, as is sometimes done. The tendency of the sap being principally towards the extremities, the spurs at these points would then become very vigorous to the detriment of those situated near the bifurcation of the two arms. Therefore, it is preferable to increase the number of vines in order to concentrate the action of the sap in a smaller space; for it is proved that, under these conditions, the vines yield more perfect fruit.

The same vine must not nourish a number of *cordons* one above the other. The upper *cordon* would end by absorbing all the sap, and the lowest one would be ruined.

We have stated that the usual distance between the *cordons* is about eighteen inches. As the space is to be filled up with shoots, it must be wide enough for them to acquire sufficient development, in order to maintain the vigor of the vine, without extending beyond and thus shading the next higher *cordon*. For very vigorous varieties, or in very fertile soil, this distance should be increased by four or even six inches.

When the position of the *cordons* is fully determined upon, it is marked upon the wall. First the base of each stock is indicated, and a vertical line is drawn, starting from this point. For the first vine, this vertical line goes as far as the first iron wire and stops there; for the second, to the third wire; for the third, to the fifth wire, and so on to the fifth *cordon*, which should come on the ninth wire. Then another series of lines parallel to the first is begun, and so on to the end of the wall. All that is to be done then is to mark out, at the top of each vertical line, the direction to be followed by the *cordons*, to the right and left of the verticals, and to indicate the point at which each of the *cordons* is to end; this point is easily determined, since it is exactly the middle point between two verticals of the same height.

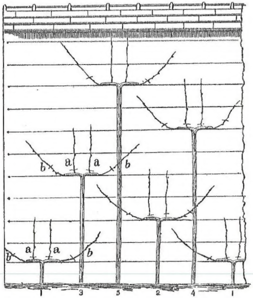

FIG. 100.

This arrangement we have just described is generally adopted in Thomery; intelligent cultivators have remarked a serious inconvenience therein. During the formation of the *cordons* the whole of one arm of every *cordon* is shadowed by the next higher *cordon*, while the opposite arm partly escapes. The result is unequal vigor in the two arms, which necessitates pinching, and even then the equilibrium is not always maintained. Mr. Charmeux, whose trellises are so famous, has planned a combination by which he avoids this inconvenience. In his vineyard the first vine comes to the first row of *cordons*, the second comes to the third row, and the third comes to the fifth, the fourth vine comes to the second row, the fifth to the fourth, and the sixth vine recommences the series by coming to the first row, etc. (See Fig. 100.)

With this arrangement the outline is marked on the wall as easily as in the preceding form; then, too, the *cordons* do not shade each other irregularly during the first years of their formation, not until they are about five years old, and thus the principal end is attained.

After the vines have been layered, and so brought close to the wall, the canes coming up from the ground are pruned to two eyes. When vegetation begins we have two shoots from each cane, but only the one that is most vigorous and best situated is reserved, and this is supported by a little stake.

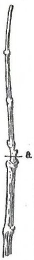

Fig. 101.

As soon as this shoot exceeds four or five buds, the height at which the *cordon* is to be established, it is pinched close to the eye that is found about two fifths or four fifths of an inch below the wire. This pinching induces the development of the side shoot, which in Thomery is designated as *entré cœur;* when it is two fifths or four fifths of an inch long, it is cut off at that point, to force the terminal eye to develop. This eye develops more or less vigorously; its wood ripens well, and eyes are developed at its base, on both the right and left sides, very close together, and well suited to form the lateral arms of the *cordon* (see Fig. 101). It is not always possible to find an eye at the exact spot we mention; but the following Autumn the earth is dug away from the foot of the vines that do not attain the height desired, and they are either buried a little deeper or raised slightly, which is very easily done, since they will need to be moved but very little.

The following Spring the cane thus prepared is cut off above the eyes at the base, at the point *a;* if it puts forth several shoots, the most suitable ones are chosen, one on each side, and the useless ones removed with the pruning knife. The two branches reserved, which are destined to form the two arms of the *cordon*, in the shape of the letter T, should be trained obliquely as long as they are herbaceous. When they have become sufficiently woody they are brought down gently to the iron wire, and attached thereto, but not too tightly, their extremities being left free.

At the next pruning each arm is topped so as to leave three eyes, taking care that the last bud reserved is found on the under side of the cane; it is preferable for the shoot that is to prolong the arm to be so situated. This terminal shoot, and the one next to it which must come from the upper side, are the only ones left this first year; all the other shoots developing near the stock are carefully suppressed.

The next year the young vines are pruned, as indicated in Figure 100; the canes *a*, *a*, developed on the *cordon* to two eyes in order to form spurs, and the terminal canes *b*, *b*, to three or four buds, always taking care that the last bud is on the under side of the cane. The prolongations are trained horizontally.

Only two shoots are allowed to develop on each of the *côts*, and only the terminal shoot, and two on the upper side, are allowed to develop on the canes that prolong the arms; all the others are suppressed.

Thus the work proceeds, the *cordon* being lengthened six or eight inches on each side every year until it meets the next *cordon*. As the arms lengthen they must be adorned with little *côts* of two eyes, about five inches apart. It is not always possible to leave the *côts* just where we would like them; they must be within the limits just mentioned.

The divers operations in Thomery during vegetation are: removing the useless shoots, cutting off the tendrils, suppressing the *entre-cœurs*, pinching, training, retraining, and cutting off some of the berries and leaves.

The first operation is performed when the herbaceous canes, that is, the young shoots, are about five inches long. Those that appear weak and those that have no fruit, are removed with the fingers. The suppression must not be too general, however, and even if there would be no fruit on them, one or two shoots must be reserved on every spur. On the canes that prolong the arms, the feeble shoots are suppressed; one vigorous shoot is left to prolong the arm, and one or two are left on the upper side to form new spurs. The *removal of tendrils, suppression of the entre-cœurs*, and *pinching*, are usually effected fifteen days after the removal of the shoots. These operations consist in ridding the vines of the tendrils (*b*, Fig. 102) that are close to the shoots, as well as those on the fruit; in suppressing, or pinching at the first leaf, the *entre-cœurs* (*a*, Fig. 102); and in topping the extremities of all the shoots that extend beyond the *cordon* immediately above.

Training is proceeded with about ten or twelve days later. This work consists in attaching every shoot separately to the wires, spreading them apart in such a manner as to cover the wall, while avoiding all confusion. The terminal shoot, having to serve as the prolongation of the arms, is trained obliquely; all the others vertically, or almost so. *Retraining* consists simply in training the backward shoots that had not reached the wire when the others were trained. They are pinched at the same time.

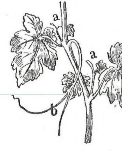

Fig. 102.

The next operation consists in removing some of the berries when the latter are about the size of a pea; with sharp scissors the smallest berries are cut out of the bunch when the latter is not too crowded;

when, on the contrary, there are too many berries in the bunch, not only the small ones, but a fourth, and sometimes a third of the large ones, are removed. This benefits the remaining berries, which increase in size and ripen sooner. Sometimes the grapes are not only thinned out, but, in young vines, very often about an inch of the clusters of fruit is cut off, if the latter are too long.

The *removal of leaves* is effected at various times; those that are in the way or badly developed, called in Thomery *feuilles frisées*, are taken off. When thinning the grapes many leaves in the interior of the vines are removed, and finally, when the fruit is ripe, it is partially uncovered, taking care to cut and not to pull off the leaf stalk. If the grapes were exposed too suddenly they might be injured by the sun, as the heat is still intense at that season. It is not until about the first of October that all the leaves are stripped off, so as to subject the fruit to the influence of the sun, dew, and fog, which adds much to its fine coloring.

This method of trellis culture used in Thomery, which we have just described, is evidently a good one; but it is not very easy to apply. It demands, in order to maintain the equilibrium of the vines, an amount of supervision and care that is seldom obtained from viticulturists, especially hired laborers.

We, ourselves, have undertaken trellis culture in the Gironde, and the method we have adopted has been sufficiently satisfactory in its excellent results for us to recommend it to our readers.

This method is simply the unilateral *cordon* applied to trellis culture. Figures 103, 104, and 105 illustrate our trellises and give an idea of the method. All the sap being conveyed to one arm, we have no fear, as in the *cordons* of Thomery, of one part of the vine developing to the detriment of the other, and, moreover, the whole surface of the wall is covered with perfect regularity.

The vine being more vigorous in our region than in the environs of Paris, we advise allowing a space of two feet, instead of eighteen inches, between the *cordons*. As for the space between the vines, it depends upon the number of *cordons* desired for a wall. If the height of the wall allows for only three rows of *cordons*, one above the other, as in Figure 103, the vines may be planted about three feet apart. If, as in Figure 104, there is space enough for four rows of *cordons*, the vines should be about two and a half feet apart. If the wall is high enough for five rows, as in Figure 105, the space between the vines should be two feet. We should state, however, that in the same sort of soil the trellis of Figure 105 will exhaust the soil sooner than that of Figure 103, and, consequently, it will be necessary to fertilize oftener.

The method of planting used in Thomery seems to us to be an excellent one, and we cannot but recommend it. The vines illustrated in Figures 103, 104, and 105, were not planted by us. We did not

take them in hand until six years ago, when they were three years old. This fact explains the irregularity in the planting. The *cordons* are now completely formed; they keep in perfect condition, and yield a quantity of excellent Chasselas. Nos. 1 and 6 of Figure 105 have developed somewhat to excess; nevertheless, they keep in excellent condition, which shows how far apart the vines may be planted. We have used this method for a great many trellises, arbors included. The three illustrations we give here (Figures 103, 104, and 105) were taken from walls of different heights, so as to demonstrate our method more clearly.

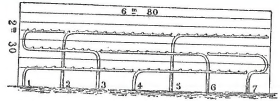

Fig. 103.

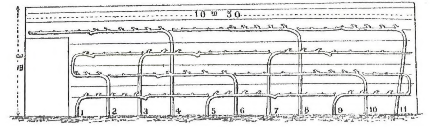

Fig. 104.

In our trellises the iron wires are about one and three fifths or two inches from the wall, and we train the vertical canes up between the wall and the wires. As is customary in Thomery, we outline the position of the *cordons* on the wall, or else we draw an exact plan which we keep before us so as to follow it scrupulously in pruning and training. When there are to be three rows of *cordons* on a wall (Fig. 103), the first vine on the left begins the lowest row of *cordons*, being trained along the bottom wire and extending as far as the fourth vine; the fourth vine extends along the same wire as far as the seventh vine, and so on, taking every third vine to form the bottom row of *cordons* and leaving the intermediate ones for the upper rows. The seventh vine extends to the end of the wall, ascends to the next row, and goes back in the opposite direction to that taken by the lower row of *cordons*, until it meets the sixth vine; the latter, in its turn, extends back to the third; the third comes to the end of the wall, ascends to

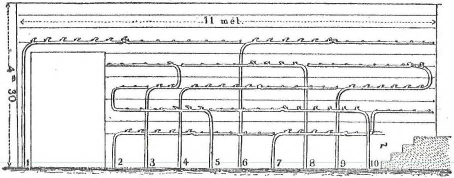

Fig. 105.

the next row, and follows along the wire until it meets the second vine; the second and fifth complete the espalier.

If the wall allows for four rows of *cordons*, the principle is the same. Figure 104 shows us a trellis formed under these conditions. Vine No. 1 begins the lowest row of *cordons*, and extends to the fifth vine, leaving three intermediate vines to form *cordons* for the next three rows; vine No. 9 comes to the end of the wall, ascends to the second row and turns back, extending to vine No. 10, which goes on in the same direction until it meets No. 6. Figure 104 shows this arrangement better than we can describe it in words.

Figure 105 shows a wall having five rows of *cordons*, trained according to the same principles. A great empty space on the left side, as well as a flight of steps at the extremity on the right, rendered the establishment of the *cordons* more difficult; but, as may be seen, the obstacle has been surmounted. A wall can always be covered, no matter how irregular the surface, by the method in question.

Sometimes our *cordons* are formed in a single year, generally in two; sometimes the upper rows are not completed before the third year.

These *cordons* on trellises are established exactly according to the same principles as those already given for the *cordon* method in Chapter VII. In forming them the vertical canes must be passed up between the wall and the iron wires; they are kept straight by means of little stakes, up to the point at which they are to take the horizontal direction; this prop, placed on the side opposite the bend, facilitates the formation of the latter.

As soon as the *cordons* are established the superfluous eyes must be removed; all those from the base of the vine to ten inches beyond the bend are suppressed; from this point on all those on the under side are suppressed. If the *cordon* has not attained the required length, the shoot that is to prolong it is left on the under side, so that the prolongation will be straight. When a *cordon* ascends from its row to the next higher, to be trained along the latter, all the eyes on the vertical part between must be suppressed. The first eye on the upper part should not be less than ten inches from the bend.

All along the *cordons* there should be *côts* or spurs pruned to two eyes, and about six or eight inches apart; when pruning, the year after the formation of the *cordons*, the greatest care should be given to establishing the *côts* at this distance from each other.

When the *cordons* are once established and adorned with spurs, there is nothing to do but to prune them regularly. This pruning is entirely elementary—the lowest shoot developed on the wood of the preceding year is pruned to two eyes; if, however, this shoot should be too slender, or faulty in its direction, a higher one would be taken.

When, after many years pruning, the spurs become too long, a shoot at their base, such as *A* (Fig. 106, or one a little higher, such as *B*), is reserved. The cane produced by this young shoot is pruned, the first year, to one eye, the old spur being preserved. The development of the shoot coming from this eye is favored by pinching the two shoots of the main spur, *c*, *c*, a little more severely. The next year the old *côt* is cut back close to the little *côt*, which then furnishes the wood for future pruning.

When the shoots are well developed all those coming from the old wood are cut off, only those being spared that are well situated for the establishment of an *œil de retour*, in case one should be wanted to take the place of the spur, if the latter becomes too long.

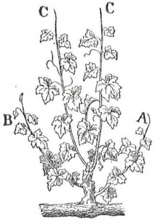

Fig. 106.

The shoots must be trained up on the wires as far as possible, one by one, without injuring the fruit. All the shoots, excepting those destined to prolong the *cordons*, should be pinched when they reach the *cordon* above; hence the trellises must be inspected from time to time, to train and pinch the shoots whose development necessitates so doing.

The rules to be followed in forming the counter-trellises and arbors are the same as those for training the *cordons* along the walls. We have stated that the counter-trellises are supported by a wooden or wire lattice instead of a wall. An arbor should be considered as two counter-trellises, separated at the base and uniting at the top.

We cannot leave the subject of pruning without speaking of the instruments used in its execution. In the Gironde, excepting in a large part of Médoc, where the pruning-knife is used almost entirely, the work is always done with shears.

We prefer work carefully executed with this instrument to that done with the knife. The latter may be more expeditious, but the workmen maltreat the vines more with it than with shears.

Since in many localities these instruments are not all that can be desired, in the interest of our readers we will recommend very particularly the excellent shears manufactured by M. Cluchet, *rue des Remparts, 52, à Bordeaux.*